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(71) Applicant: **LG ELECTRONICS INC.**
Yeongdeungpo-gu
Seoul 07336 (KR)

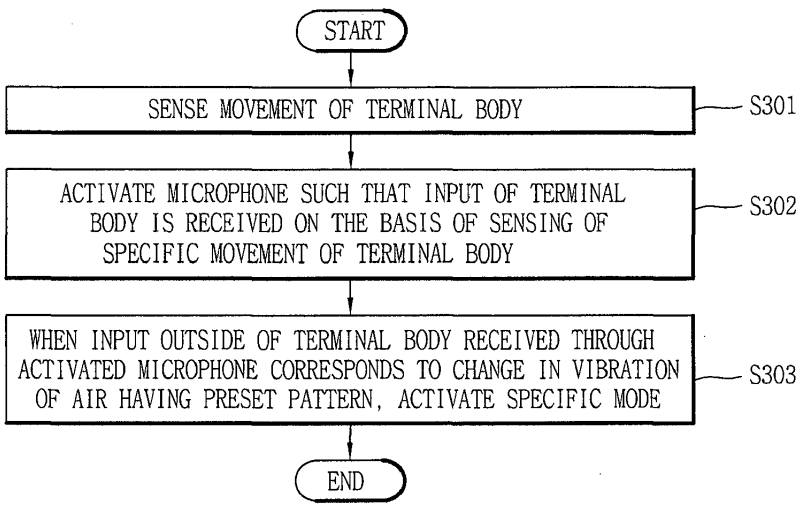
(72) Inventors:
- **LEE, Chulhee**
  Seoul 06772 (KR)
- **LIM, Kyungah**
  Seoul 06772 (KR)
- **KIM, Sehee**
  Seoul 06772 (KR)
- **MOON, Youseok**
  Seoul 06772 (KR)

(74) Representative: **Beyer, Andreas**
Wuesthoff & Wuesthoff
Patentanwälte PartG mbB
Schweigerstrasse 2
81541 München (DE)

(54) MOBILE TERMINAL AND METHOD FOR CONTROLLING THE SAME

(57) A mobile terminal may activate a specific mode on the basis of an external input received through a microphone activated on the basis of a specific condition. The mobile terminal includes a terminal body, a microphone disposed on the terminal body and configured to receive an input outside of the terminal body, a sensor configured to sense a movement of the terminal body, and a controller configured to activate the microphone on the basis of a specific movement of the terminal body sensed by the sensor, and activate a specific mode when the input outside of the terminal body received through the activate microphone corresponds to a change in vibration of air having a preset pattern.

FIG. 3A



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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present disclosure relates to a mobile terminal capable of executing a mode in which input is received, and a method for controlling the same.

2. Background of the Invention

[0002] Terminals may be generally classified as mobile/portable terminals or stationary terminals according to their mobility. Mobile terminals may also be classified as handheld terminals or vehicle mounted terminals according to whether or not a user can directly carry the terminal.

[0003] Mobile terminals have become increasingly more functional. Examples of such functions include data and voice communications, capturing images and video via a camera, recording audio, playing music files via a speaker system, and displaying images and video on a display. Some mobile terminals include additional functionality which supports game playing, while other terminals are configured as multimedia players. More recently, mobile terminals have been configured to receive broadcast and multicast signals which permit viewing of content such as videos and television programs.

[0004] As functions of terminals become more diversified, terminals are implemented in the form of a multimedia player including composite functions such as capturing images or video, reproducing music or video files, playing games, receiving broadcast signals, and the like.

[0005] In order to support and increase functions of terminals, improvement of structural parts and/or software parts of terminals may be taken into consideration.

[0006] Also, a microphone may be installed in the main body of the mobile terminal and may receive various inputs so that a user may execute functions conveniently. For example, the microphone may receive a user's voice input, and the mobile terminal according to an exemplary embodiment of the present disclosure may provide a voice recognition function of executing a function corresponding to the voice input.

[0007] Meanwhile, research has been conducted to provide a more convenient interface environment to users by utilizing various inputs received through the microphone, in addition to the voice input.

SUMMARY OF THE INVENTION

[0008] Therefore, an aspect of the detailed description is to provide a mobile terminal capable of executing a specific mode in response to a preset external input received by a microphone activated in a specific manner, and a method for controlling the same.

[0009] To achieve these and other advantages and in accordance with the purpose of this specification, as embodied and broadly described herein, a mobile terminal may include: a terminal body; a microphone installed in the terminal body and configured to receive an input outside of the terminal body; a sensor configured to sense a movement of the terminal body; and a controller configured to activate the microphone on the basis of a specific movement of the terminal body sensed by the , and activate a specific mode when the input outside of the terminal body received through the activate microphone corresponds to a change in vibration of air having a preset pattern.

[0010] In an embodiment of the present disclosure, the mobile terminal may further include: a touch screen installed in the terminal body and configured to receive a touch input, wherein the specific mode may be a mode in which information formed by at least one of a touch input applied to the touch screen and a voice input received through the microphone is received.

[0011] In an embodiment of the present disclosure, the specific mode may be maintained in an activated state for a preset period of time, and the controller may control the touch screen such that a preset input screen able to display the formed information is output on at least a portion of the touch screen on the basis of the activation of the specific mode.

[0012] In an embodiment of the present disclosure, when the touch screen is in a deactivated state in which lighting is turned off, the controller may activate the specific mode, while switching at least a portion of the touch screen to an activated state.

[0013] In an embodiment of the present disclosure, the controller may control the touch screen such that at least one of a size and transparency of the preset input screen is changed over time, and when the preset period of time has lapsed, the controller may control the touch screen such that outputting of the preset input screen is terminated.

[0014] In an embodiment of the present disclosure, when a specific input is received through the microphone before the preset period of time has lapsed, the controller may control the touch screen such that outputting of the preset input screen is maintained for the preset period of time starting from a point in time at which the specific input is received.

[0015] In an embodiment of the present disclosure, when the formed information is displayed on the preset input screen, the controller may store image information corresponding to at least a portion of the preset input screen when a preset condition is met before outputting of the preset input screen is terminated.

[0016] In an embodiment of the present disclosure, the preset condition may be related to at least one of reception of a specific input through the microphone, a lapse of the preset period of time, and sensing of a specific movement of the terminal body by the sensor.

[0017] In an embodiment of the present disclosure, when the image information is output on the touch screen

on the basis of an output request from the user, the controller may control the touch screen such that outputting of the image information is terminated when the preset period of time has lapsed.

[0018] In an embodiment of the present disclosure, when the image information is specific image information stored together with preset authentication information, the controller may limit outputting of a portion of the specific image information, and when a specific input is received through the microphone, the controller may control the touch screen such that the other remaining portion of the specific image information is output.

[0019] In an embodiment of the present disclosure, the controller may determine an output size of the preset input screen on the basis of at least one of a degree of a change in vibration of air corresponding to an input outside of the terminal body and a time duration in which an input outside of the terminal body is received.

[0020] In an embodiment of the present disclosure, when an input outside of the terminal body is received in a state in which a touch is applied to one point of the touch screen, the controller may control the touch screen such that the preset input screen is output at a position corresponding to the one point on the touch screen.

[0021] In an embodiment of the present disclosure, when screen information is output on the touch screen, the controller may control the touch screen such that the preset input screen having preset transparency is output on at least a portion of the screen information in an overlapping manner.

[0022] In an embodiment of the present disclosure, when the formed information is displayed on the preset input screen, the controller may control the touch screen such that transparency of the portion in which the formed information is displayed is changed.

[0023] In an embodiment of the present disclosure, when a preset type of first user input is received, the controller may store image information corresponding to the preset input screen, when a preset type of second user input is received, the controller may store image information corresponding to the preset input screen and at least a portion of the screen information, and the first and second user inputs may be received by at least one of the microphone, the touch screen, and the sensor.

[0024] To achieve these and other advantages and in accordance with the purpose of this specification, as embodied and broadly described herein, a method for controlling a mobile terminal may include: sensing a movement of a terminal body; when the movement of the terminal body is sensed as a specific movement, activating a microphone installed in the terminal body; and when an input outside of the terminal body received through the activated microphone corresponds to a change in vibration of air having a preset pattern, activating the specific mode.

[0025] In an embodiment of the present disclosure, the specific mode may be a mode in which information formed by at least one of a touch input applied to a touch screen installed in the terminal body and a voice input received through the microphone is received.

[0026] In an embodiment of the present disclosure, the method may further include: outputting a preset input screen able to display the formed information on at least a portion of the touch screen on the basis of the activation of the specific mode; and when a preset period of time has lapsed after the preset input screen is output on the touch screen, terminating outputting of the preset input screen.

[0027] In an embodiment of the present disclosure, at least one of a size and transparency of the preset input screen may be changed over time within the preset period of time.

[0028] In an embodiment of the present disclosure, when the touch screen is in a deactivated state in which lighting is turned off, the specific mode is activated, while at least a portion of the touch screen is switched to an activated state.

[0029] As described above, according to the mobile terminal of an embodiment of the present disclosure, when the microphone is activated in a specific manner and a preset input is applied to the microphone, a mode for receiving a touch and voice information formed by the user by applying a specific visual effect thereto may be executed. Also, the specific visual effect may be variously applied on the basis of the preset input applied through the microphone.

[0030] Thus, the user may form a memo to which various and funny visual effects are applied by variously applying the preset input.

[0031] Further scope of applicability of the present application will become more apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from the detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate exemplary embodiments and together with the description serve to explain the principles of the invention.

[0033] In the drawings:

FIG. 1A is a block diagram of a mobile terminal in accordance with the present disclosure.

FIGS. 1B and 1C are conceptual views of one example of the mobile terminal, viewed from different directions.

FIG. 2 is a perspective view illustrating an example of an external device 300 related to another exem-

plary embodiment of the present disclosure.

FIG. 3A is a flow chart illustrating a method for controlling a mobile terminal according to an exemplary embodiment of the present disclosure.

FIG. 3B is a representative view illustrating a method for controlling a mobile terminal according to an exemplary embodiment of the present disclosure.

FIGS. 4A, 4B, 4C, and 4D are views illustrating embodiments related to output states of preset input screens.

FIGS. 5A, 5B, and 5C are views illustrating embodiments regarding activation of preset input screens.

FIGS. 6A and 6B are views illustrating embodiments in which information input by a user is displayed on a preset input screen.

FIGS. 7A, 7B, and 7C are views illustrating embodiments regarding activation of a specific mode in a state in which screen information is output.

FIGS. 8A and 8B are views illustrating embodiments related to outputting stored image information by activating a specific mode.

DETAILED DESCRIPTION OF THE INVENTION

[0034] Description will now be given in detail according to exemplary embodiments disclosed herein, with reference to the accompanying drawings. For the sake of brief description with reference to the drawings, the same or equivalent components may be provided with the same or similar reference numbers, and description thereof will not be repeated. In general, a suffix such as "module" and "unit" may be used to refer to elements or components. Use of such a suffix herein is merely intended to facilitate description of the specification, and the suffix itself is not intended to give any special meaning or function. In the present disclosure, that which is well-known to one of ordinary skill in the relevant art has generally been omitted for the sake of brevity. The accompanying drawings are used to help easily understand various technical features and it should be understood that the embodiments presented herein are not limited by the accompanying drawings. As such, the present disclosure should be construed to extend to any alterations, equivalents and substitutes in addition to those which are particularly set out in the accompanying drawings.

[0035] Mobile terminals presented herein may be implemented using a variety of different types of terminals. Examples of such terminals include cellular phones, smart phones, user equipment, laptop computers, digital broadcast terminals, personal digital assistants (PDAs), portable multimedia players (PMPs), navigators, portable computers (PCs), slate PCs, tablet PCs, ultra books, wearable devices (for example, smart watches, smart glasses, head mounted displays (HMDs)), and the like.

[0036] By way of non-limiting example only, further description will be made with reference to particular types of mobile terminals. However, such teachings apply equally to other types of terminals, such as those types noted above. In addition, these teachings may also be applied to stationary terminals such as digital TV, desktop computers, and the like.

[0037] Reference is now made to FIGS. 1A-1C, where FIG. 1A is a block diagram of a mobile terminal in accordance with the present disclosure, and FIGS. 1B and 1C are conceptual views of one example of the mobile terminal, viewed from different directions.

[0038] The mobile terminal 100 is shown having components such as a wireless communication unit 110, an input unit 120, a sensing unit (or a sensor) 140, an output unit 150, an interface unit 160, a memory 170, a control unit (a controller) 180, and a power supply unit 190. It is understood that implementing all of the illustrated components is not a requirement, and that greater or fewer components may alternatively be implemented.

[0039] The wireless communication unit 110 typically includes one or more modules which permit communications such as wireless communications between the mobile terminal 100 and a wireless communication system, communications between the mobile terminal 100 and another mobile terminal, communications between the mobile terminal 100 and an external server.

[0040] Further, the wireless communication unit 110 typically includes one or more modules which connect the mobile terminal 100 to one or more networks. To facilitate such communications, the wireless communication unit 110 includes one or more of a broadcast receiving module 111, a mobile communication module 112, a wireless Internet module 113, a short-range communication module 114, and a location information module 115.

[0041] The input unit 120 includes a camera 121 for obtaining images or video, a microphone 122, which is one type of audio input device for inputting an audio signal, and a user input unit 123 (for example, a touch key, a push key, a mechanical key, a soft key, and the like) for allowing a user to input information. Data (for example, audio, video, image, and the like) is obtained by the input unit 120 and may be analyzed and processed by control unit 180 according to device parameters, user commands, and combinations thereof.

[0042] The sensing unit 140 is typically implemented using one or more sensors configured to sense internal information of the mobile terminal, the surrounding environment of the mobile terminal, user information, and the like. For example, in FIG. 1A, the sensing unit 140 is shown having a proximity sensor 141 and an illumination sensor 142. If desired, the sensing unit 140 may alternatively or additionally include other types of sensors or devices, such as a touch sensor, an acceleration sensor, a magnetic sensor, a G-sensor, a gyroscope sensor, a motion sensor, an RGB sensor, an infrared (IR) sensor, a finger scan sensor, a ultrasonic sensor, an optical sensor (for example, camera 121), a microphone 122, a battery gauge, an environment sensor (for example, a barometer, a hygrometer, a thermometer, a radiation detection sensor, a thermal sensor, and a gas sensor,

among others), and a chemical sensor (for example, an electronic nose, a health care sensor, a biometric sensor, and the like), to name a few. The mobile terminal 100 may be configured to utilize information obtained from sensing unit 140, and in particular, information obtained from one or more sensors of the sensing unit 140, and combinations thereof.

[0043] The output unit 150 is typically configured to output various types of information, such as audio, video, tactile output, and the like. The output unit 150 is shown having a display unit 151, an audio output module 152, a haptic module 153, and an optical output module 154.

[0044] The display unit 151 may have an inter-layered structure or an integrated structure with a touch sensor in order to facilitate a touch screen. The touch screen may provide an output interface between the mobile terminal 100 and a user, as well as function as the user input unit 123 which provides an input interface between the mobile terminal 100 and the user.

[0045] The interface unit 160 serves as an interface with various types of external devices that can be coupled to the mobile terminal 100. The interface unit 160, for example, may include any of wired or wireless ports, external power supply ports, wired or wireless data ports, memory card ports, ports for connecting a device having an identification module, audio input/output (I/O) ports, video I/O ports, earphone ports, and the like. In some cases, the mobile terminal 100 may perform assorted control functions associated with a connected external device, in response to the external device being connected to the interface unit 160.

[0046] The memory 170 is typically implemented to store data to support various functions or features of the mobile terminal 100. For instance, the memory 170 may be configured to store application programs executed in the mobile terminal 100, data or instructions for operations of the mobile terminal 100, and the like. Some of these application programs may be downloaded from an external server via wireless communication. Other application programs may be installed within the mobile terminal 100 at time of manufacturing or shipping, which is typically the case for basic functions of the mobile terminal 100 (for example, receiving a call, placing a call, receiving a message, sending a message, and the like). It is common for application programs to be stored in the memory 170, installed in the mobile terminal 100, and executed by the control unit 180 to perform an operation (or function) for the mobile terminal 100.

[0047] The control unit 180 typically functions to control overall operation of the mobile terminal 100, in addition to the operations associated with the application programs. The control unit 180 may provide or process information or functions appropriate for a user by processing signals, data, information and the like, which are input or output by the various components depicted in Fig. 1A, or activating application programs stored in the memory 170. As one example, the control unit 180 controls some or all of the components illustrated in FIGS. 1A-1C according to the execution of an application program that have been stored in the memory 170.

[0048] The power supply unit 190 can be configured to receive external power or provide internal power in order to supply appropriate power required for operating elements and components included in the mobile terminal 100. The power supply unit 190 may include a battery, and the battery may be configured to be embedded in the terminal body, or configured to be detachable from the terminal body.

[0049] At least some of the above components may operate in a cooperating manner, so as to implement an operation or a control method of a glass type terminal according to various embodiments to be explained later. The operation or the control method of the glass type terminal may be implemented on the glass type terminal by driving at least one application program stored in the memory 170.

[0050] Mobile terminals presented herein may be implemented using a variety of different types of terminals. Examples of such terminals include cellular phones, smart phones, user equipment, laptop computers, digital broadcast terminals, personal digital assistants (PDAs), portable multimedia players (PMPs), navigators, portable computers (PCs), slate PCs, tablet PCs, ultra books, wearable devices (for example, smart watches, smart glasses, head mounted displays (HMDs)), and the like.

[0051] In some embodiments, another mobile terminal (which may be configured similarly to mobile terminal 100) may be a wearable device, for example, a smart watch, a smart glass or a head mounted display (HMD), which is able to exchange data with the mobile terminal 100 (or otherwise cooperate with the mobile terminal 100). The short-range communication module 114 may sense or recognize the wearable device, and permit communication between the wearable device and the mobile terminal 100. In addition, when the sensed wearable device is a device which is authenticated to communicate with the mobile terminal 100, the control unit 180, for example, may cause transmission of data processed in the mobile terminal 100 to the wearable device via the short-range communication module 114. Hence, a user of the wearable device may use the data processed in the mobile terminal 100 on the wearable device. For example, when a call is received in the mobile terminal 100, the user may answer the call using the wearable device. Also, when a message is received in the mobile terminal 100, the user can check the received message using the wearable device.

[0052] FIG. 2 is a perspective view illustrating one example of an external device 300 in accordance with another exemplary embodiment.

[0053] As illustrated in FIG. 2, the external device 300 includes a main body 301 with a display unit 351 and a band 302 connected to the main body 301 to be wearable on a wrist. In general, the external terminal 300 may be configured to include features that are the same or similar to that of mobile terminal 100 of FIGS. 1A-1C .

[0054] The main body 301 may include a case having a certain appearance. As illustrated, the case may include a first case 301a and a second case 301b cooperatively defining an inner space for accommodating various electronic components. Other configurations are possible. For instance, a single case may alternatively be implemented, with such a case being configured to define the inner space, thereby implementing a mobile terminal 300 with a uni-body.

[0055] The external device 300 can perform wireless communication, and an antenna for the wireless communication can be installed in the main body 301. The antenna may extend its function using the case. For example, a case including a conductive material may be electrically connected to the antenna to extend a ground area or a radiation area.

[0056] The display unit 351 is shown located at the front side of the main body 301 so that displayed information is viewable to a user. In some embodiments, the display unit 351 includes a touch sensor so that the display unit can function as a touch screen. As illustrated, window 351a is positioned on the first case 301a to form a front surface of the terminal body together with the first case 301a.

[0057] The illustrated embodiment includes audio output module 352, a camera 321, a microphone 322, and a user input unit 323 positioned on the main body 301. When the display unit 351 is implemented as a touch screen, additional function keys may be minimized or eliminated. For example, when the touch screen is implemented, the user input unit 323 may be omitted.

[0058] The band 302 is commonly worn on the user's wrist and may be made of a flexible material for facilitating wearing of the device. As one example, the band 302 may be made of fur, rubber, silicon, synthetic resin, or the like. The band 302 may also be configured to be detachable from the main body 301. Accordingly, the band 302 may be replaceable with various types of bands according to a user's preference.

[0059] In one configuration, the band 302 may be used for extending the performance of the antenna. For example, the band may include therein a ground extending portion (not shown) electrically connected to the antenna to extend a ground area.

[0060] The band 302 may include fastener 302a. The fastener 302a may be implemented into a buckle type, a snap-fit hook structure, a Velcro® type, or the like, and include a flexible section or material. The drawing illustrates an example that the fastener 302a is implemented using a buckle.

[0061] When a preset input is received through a microphone, a specific mode of the mobile terminal according to an exemplary embodiment of the present disclosure may be activated. Here, the specific mode is a type of memo mode in which information input by a user is received. In a state in which the specific mode is activated, the input information may be output to a touch screen according to a specific visual effect. For example, the specific visual effect may refer to an effect of maintaining an output state only for a preset period of time or an effect of changing the output state with the lapse of time.

[0062] Thus, the user may store or utilize information input by the user himself or herself by applying various visual effects thereto by using the specific mode.

[0063] Hereinafter, exemplary embodiments related to a control method that may be implemented in the mobile terminal configured as described above will be described with reference to the accompanying drawings. It will be apparent to those skilled in the art that modifications and variations can be made without departing from the spirit and scope of the invention.

[0064] FIG. 3A is a flow chart illustrating a method for controlling a mobile terminal according to an exemplary embodiment of the present disclosure, and FIG. 3B is a representative view illustrating a method for controlling a mobile terminal according to an exemplary embodiment of the present disclosure.

[0065] First, referring to FIG. 3A, the mobile terminal according to an exemplary embodiment of the present disclosure may sense a movement of the main body of the mobile terminal by the sensor 140 in step S301.

[0066] The sensing unit 140 of the mobile terminal 100 according to an exemplary embodiment of the present disclosure may include various sensors for sensing at least one of information within the mobile terminal, information regarding a surrounding environment around the mobile terminal 100, and user information.

[0067] For example, the sensing unit 140 may include a proximity sensor sensing various user's gestures with respect to the main body of the mobile terminal 100, or a camera. Also, the sensing unit 140 may include a gyroscope sensor or an accelerometer sensing a movement of tilting or shaking of the main body of the mobile terminal 100 in a specific direction.

[0068] The control unit 180 may determine the movement of the main body of the mobile terminal 100 on the basis of the pieces of information sensed by the various sensors.

[0069] Also, in the mobile terminal 100 according to an exemplary embodiment of the present disclosure, the microphone 122 is installed in (or disposed on) the main body of the mobile terminal 100, and an input outside of the main body of the mobile terminal 100 may be received through the microphone 122. Here, the input from the outside of the main body of the mobile terminal 100 may refer to any type of sound event generated outside of the main body of the mobile terminal 100, for example, various types of acoustic information such as a person's voice, a sound of a specific musical instrument, a music sound, a vibration sound, and the like.

[0070] Also, the input from the outside of the main body of the mobile terminal 100 may include any type of input vibrating air outside of the main body of the mobile terminal 100, without generating a specific sound, like puffing or user's breath.

[0071] When a specific movement of the main body of

the mobile terminal 100 is sensed by the sensing unit 140, the control unit 180 may activate the microphone 122 to receive an input from the outside of the main body of the mobile terminal 100 in step S302.

[0072] The specific movement of the main body of the mobile terminal 100 may include a movement of tilting the main body of the mobile terminal 100 in a specific direction or a movement of moving the main body of the mobile terminal 100 by a preset number of times. That is, as illustrated in the first drawing of FIG. 3B, the specific movement of the main body of the mobile terminal 100 may be a movement of shaking the main body of the mobile terminal 100 from side to side. In this case, at least one of the gyroscope sensor and the accelerometer included in the sensing unit 140 may be used.

[0073] In another example, the specific movement of the main body of the mobile terminal 100 may be a movement of bringing at least a portion of the main body of the mobile terminal 100 closer to the user. That is, user access to at least a portion of the main body of the mobile terminal 100 on the basis of at least one of the proximity sensor and the camera included in the sensing unit 140 may be sensed.

[0074] In a specific example, a movement of moving the main body of the mobile terminal 100 such that at least a portion of the main body of the mobile terminal 100 corresponding to a position where the microphone 122 is installed (or disposed) is close to the user's mouth may be sensed. In this case, the controller 180 may analyze information sensed by the sensing unit 140 and determine that the specific movement of the main body of the mobile terminal 100 has been sensed.

[0075] When the specific movement of the main body of the mobile terminal 100 is sensed by the sensing unit 140, the control unit 180 may activate the microphone 122 to receive an input from the outside of the main body of the mobile terminal 100.

[0076] Also, after the microphone 122 is activated, in a case in which the input from the outside of the main body of the mobile terminal 100 received through the activated microphone 122 corresponds to a change in vibration of air having a preset pattern, the control unit 180 may activate a specific mode in step S303.

[0077] Here, the change in vibration in air having a predetermined pattern may refer to at least one of a change in vibration of air having a degree of a change equal to or greater than a preset degree and a change in vibration of air maintained for a period of time equal to or greater than a preset period of time.

[0078] That is, in a case in which the change in vibration of air corresponding to the input from the outside of the main body of the mobile terminal 100 is sensed to be equal to or greater than the preset degree of a change, the control unit 180 may determine that the input from the outside of the main body of the mobile terminal 100 corresponds to a change in vibration of air having a preset pattern.

[0079] Also, when it is sensed that the change in vibration of air corresponding to the input from the outside of the main body of the mobile terminal 100 is maintained for a period of time equal to or greater than the preset period of time or is a change equal to or greater than the preset degree and maintained for the preset period of time, the control unit 180 may determine that the input from the outside of the main body of the mobile terminal 100 corresponds to the change in vibration of air having the preset pattern.

[0080] In a specific example, a change in vibration of air having the preset pattern may be sensed as air outside of the main body of the mobile terminal 100 vibrates on the basis of breath or puffing formed (or taken) by the user. That is, as illustrated in the second drawing of FIG. 3B, the input from the outside of the main body of the mobile terminal 100 formed on the basis of specific puff or breath formed by the user may be received through the microphone 122.

[0081] Alternatively, the change in vibration of air having the preset pattern may be a sound event corresponding to a simple phoneme or a syllable not having a specific meaning. In this case, the control unit 180 may determine whether the external input received through the microphone 122 is a change in vibration of air corresponding to the sound event.

[0082] Meanwhile, in order to sense such a change in vibration of air, the mobile terminal 100 according to an exemplary embodiment of the present disclosure may include at least one microphone 122. In addition, the mobile terminal 100 according to the present exemplary embodiment may sense breath or puff formed by the user by using other sensors included in the sensing unit 140.

[0083] For example, the mobile terminal 100 according to an exemplary embodiment of the present disclosure may measure at least one of a temperature and humidity of ambient air of the main body of the mobile terminal 100 by using at least one of a temperature sensor and humidity sensor included in the sensing unit 140. The control unit 180 may analyze a value measured by at least one of the temperature sensor and the humidity sensor to determine whether an external input corresponding to a change in vibration of air having a preset pattern has been received.

[0084] In this manner, in a case in which a change in vibration of air corresponding to input from the outside of the main body of the mobile terminal 100 corresponds to a change in vibration of air having a preset pattern, the control unit 180 may activate a specific mode.

[0085] The specific mode may be a memo mode in which information input from the user is formed as image information having a specific visual effect. Here, the information input from the user may be at least one of information formed on the basis of a touch input applied to the touch screen 151 provided in the mobile terminal 100 and information formed on the basis of a voice input received through the microphone 122. That is, the specific mode may be a memo mode in which information formed on the basis of at least one of the touch input and the

voice input is received.

[0086] The control unit 180 may output a preset input screen on at least a portion of the touch screen 151 so that information input from the user may be displayed. Here, the preset input screen may be a screen in which the formed information is displayed to have a specific visual effect. That is, referring to the third drawing of FIG. 3B, a preset input screen 10 may be output on at least a portion of the touch screen 151.

[0087] Meanwhile, as illustrated in the second drawing of FIG. 3B, when the touch screen 151 is in a deactivated state in which lighting is turned off before the specific mode is activated, the control unit 180 may activate the specific mode, while activating at least a portion of the touch screen 151, on the basis of the reception of the change in vibration of air having the preset pattern. Here, activating at least a portion of the touch screen 151 may refer to changing the touch screen 151 to a state in which visual information is displayed in at least a portion thereof.

[0088] The control unit 180 may control the touch screen 151 such that the information formed on the basis of the touch input applied to the touch screen 151 is displayed in the preset input screen in response to the application of the touch input. In detail, the control unit 180 may control the touch screen 151 such that the formed information is displayed according to a region to which the touch has been applied, a direction in which the touch has been moved, a position of the touch, and a speed at which the touch has been applied.

[0089] That is, as illustrated in the fourth drawing of FIG. 3B, in the control unit 180 may control the touch screen 151 such that a portion corresponding to a region to which the touch has been applied is discriminately displayed according to a movement of the touch. Thus, the user may immediately check information formed on the basis of a touch applied to the touch screen 151 by the user. Thereafter, when the touch input by the user is completed, the formed information 20 may be displayed on the preset input screen 10 as illustrated in the fifth drawing of FIG. 3B.

[0090] In another example, when a voice input is received through the microphone 122, the control unit 180 may control the touch screen 151 such that the information formed on the basis of the voice input is displayed on the preset input screen in a preset style of handwriting. In this case, the control unit 180 may adjust a display speed and a display size of the information corresponding to the voice input such that the information may correspond to the speed at which the voice input is received and a magnitude of the voice input.

[0091] Also, an output state of the preset input screen may be determined to correspond to a change in vibration of air of the preset pattern. For example, an output size of the preset input screen may be varied according to whether it is output on the basis of a change in vibration of air having a preset first change degree or whether it is output on the basis of a change in vibration of air having a preset second change degree. An output state such as an output size or a position of the preset input screen will be described with reference to FIGS. 4A, 4B, 4C, and 4D hereinafter.

[0092] Also, the specific mode may be a memo mode maintained in an activated state for a preset period of time. That is, the specific mode may be a mode in which a memo is formed only regarding information input within a preset time after the specific mode is activated.

[0093] That is, when the specific mode is activated, the control unit 180 may output the preset input screen to at least a portion of the touch screen 151, and when the preset period of time has lapsed, the control unit 180 may control the touch screen 151 to terminate outputting of the preset input screen.

[0094] Also, the control unit 180 may control the touch screen 151 such that a specific visual effect that an output state of the preset input screen is changed with the passage of time appears within the preset period of time.

[0095] For example, the control unit 180 may control the touch screen 151 to change at least one of a size and transparency of the preset input screen with the passage of time within the preset period of time. Also, when a specific input is received through the microphone before the preset period of time expires, the control unit 180 may limit termination of output of the preset input screen. This will be described with reference to FIGS. 5A, 5B, and 5C hereinafter.

[0096] Meanwhile, in a case in which output of the preset input screen is terminated on the basis of the lapse of the preset period of time, the control unit 180 may store image information corresponding to the preset input screen.

[0097] Here, the image information may include information regarding a specific visual effect that information input by the user is displayed on the preset input screen within a preset period of time. Also, the image information may include information regarding specific visual effect that an output state of the preset input screen is changed within the preset period of time.

[0098] In a case in which there is a user's output request regarding the image information after the image information is stored, the control unit 180 may control the touch screen 151 to output the image information on the basis of the information regarding the specific visual effect included in the image information.

[0099] In this manner, in the mobile terminal 100 according to an embodiment of the present disclosure, when the microphone 122 is activated in a specific manner, a specific mode may be activated on the basis of a specific input received by the microphone 122. That is, in addition to the execution of the voice recognition function as a function corresponding to a voice input by the user, the microphone 122 may be activated to receive an input for executing a preset specific mode.

[0100] Thus, the user may immediately execute the specific mode by activating the microphone 122 in a specific manner, without having to input a separate voice or input a control command for executing the specific mode.

[0101] Also, the preset input screen output on the basis of the activation of the specific mode may be output when an input (a change in vibration of air having a preset pattern) corresponding to breath or puffing applied from the user. Also, the preset input screen may be, for example, a screen having a visual effect such that a glass window is fogged when the user blow his or her breath thereon. Thus, when the user applies a touch to the preset input screen, he or she may be provided with a visual effect which is distinctive and funny like the user scribbles on the fogged glass window.

[0102] As described above, the preset input screen is output on the basis of activation of the specific mode, and an output state thereof may be determined on the basis of an external input corresponding to a change in vibration of air having a preset pattern. The control unit 180 may receive an external input through the microphone 122, and may analyze the external input using pieces of information sensed by a plurality of sensors.

[0103] For example, the control unit 180 may analyze characteristics such as strength of the external input or an application time duration on the basis of at least one of a degree by which vibration of air corresponding to the external input received through the microphone 122 is changed or a time duration in which the change in vibration of air is maintained.

[0104] Also, the control unit 180 may more accurately analyze the external input by using a measurement value of at least one of the temperature sensor and the humidity sensor with respect to the external input. That is, in a case in which user's breath is applied as the external input, the control unit 180 may more minutely analyze strength of the breach by using a measurement value of a temperature and humidity of the breath.

[0105] In this manner, when the external input is analyzed, the control unit 180 may determine an output state of the preset input screen on the basis of the analyzed characteristics of the external input. Here, the output state may refer to a state related to at least one of a size, a position, and transparency of the preset input screen output on the touch screen 151.

[0106] FIGS. 4A, 4B, 4C, and 4D are views illustrating embodiments related to output states of preset input screens.

[0107] First, referring to FIG. 4A, as illustrated in the first drawing of FIG. 4A, when a specific movement of the main body of the mobile terminal 100 is sensed, the control unit 180 may activate the microphone 122. Also, in a case in which an external input outside of the terminal body corresponding to a change in vibration of air having a preset pattern is received through the activated microphone 122, the control unit 18 may analyze the change in variation of air corresponding to the external input of the terminal body and determine the external input of the terminal body.

[0108] For example, the control unit 180 may determine strength of the external input of the terminal body by analyzing a degree of the change in vibration of air corresponding to the external input of the terminal body. That is, it may be determined that strength of the external input of the terminal body is stronger as the degree of change in vibration of air corresponding to the external input of the terminal body is greater.

[0109] When it is determined that the external input of the terminal body received through the microphone 122 has a preset first strength as in the first case of FIG. 4, the control unit 180 may input a preset input screen 11a having a size corresponding to the first strength to the touch screen 151.

[0110] Alternatively, when it is determined that the external input of the terminal body received through the microphone 122 has a preset second strength greater than the first strength as in the second case of FIG. 4A, the control unit 180 may output an input screen 11b greater in size than that of the preset input screen 11a to the touch screen 151.

[0111] Although not shown, on the basis of a time at which an external input of the terminal body is received, the control unit 180 may control the touch screen 151 such that the input screen has a different size.

[0112] Thus, by adjusting the strength of the external input of the terminal body applied through the microphone 122, the user may freely form an input screen having a desired size.

[0113] Also, in a state in which the preset input screen is output, when an additional input is applied, the control unit 1 80 may adjust a size of the preset input screen.

[0114] That is, in a state in which the microphone 122 is activated as illustrated in the first drawing of FIG. 4B, when an external input of the terminal body corresponding to a change in vibration of air having a preset pattern is received through the microphone 122 as illustrated in the second drawing of FIG. 4B, the preset input screen 12 may be output on at least a portion of the touch screen 15 as illustrated in the third drawing of FIG. 4B.

[0115] Also, in a deactivated state in which lighting of the touch screen 151 is turned off as illustrated in the first drawing of FIG. 4B, when external input of the terminal body is received through the microphone 122, the control unit 180 may activate the specific mode, while activating at least a portion of the touch screen 151. That is, when the at least a portion of the touch screen 151 is activated, the at least portion of the touch screen 151 may be switched to a state in which visual information can be displayed.

[0116] Thus, as illustrated in the third drawing of FIG. 4B, when a specific touch is applied to the preset input screen 12a output on at least a portion of the touch screen 151, the control unit 180 may control the touch screen 151 such that a size of the preset input screen 12a is changed.

[0117] For example, when a first touch (for example, a pinch out touch) is applied as the specific touch, the control unit 180 may control the touch screen 151 such that the preset input screen 12a is changed to an input screen 12b having a larger size as illustrated in the fourth

drawing of FIG. 4B. In this case, the control unit 180 may control the touch screen 151 such that a region corresponding to the portion having the increased size is additionally switched to an activated state.

[0118] In another example, when a second touch (for example, a pinch in touch) is applied as the specific touch, the control unit 180 may control the touch screen 151 such that a size of the preset input screen is reduced.

[0119] Thus, even after the preset input screen is output, the user may easily adjust a size of the preset input screen by using an additional input.

[0120] Also, the user may adjust a position at which the preset input screen is output, by applying an input different from the input outside of the terminal body together.

[0121] That is, referring to FIG. 4C, in a case in which an external input corresponding to a change in vibration of air having a preset pattern is received through the microphone 122 in a state in which a touch applied to one point of the touch screen 151 is maintained, the control unit 180 may output the preset input screen to the position corresponding to the one point.

[0122] In detail, as illustrated in the first case of FIG. 4C, when an input outside of the terminal body is received through the microphone 122 in a state in which a touch applied to one point of a right upper end portion of the touch screen 151 is maintained, the control unit 180 may output a preset screen 13a to a position corresponding to the one point.

[0123] Also, as illustrated in the second case of FIG. 4C, when an input outside of the terminal body is received through the microphone 122 in a state in which a touch is maintained in a different point of a left upper end portion of the touch screen 151, the control unit 180 may output a preset input screen 13b to a position corresponding to the different point.

[0124] The control unit 180 may control the touch screen 151 such that a middle point of the preset input screen is placed at a position corresponding to the point to which the touch is applied. Thus, even though a shape of the preset input screen is set in advance, a shape of the preset input screen output on the touch screen 151 may be varied according to positions to which the touch is applied.

[0125] Also, in a state in which the preset input screen is output, when a touch input is additionally applied, the control unit 180 may change the position to which the preset input screen is output. That is, as illustrated in the third drawing of FIG. 4D, the preset input screen 14 may be output at a preset position on the touch screen 151.

[0126] Here, as illustrated in the third drawing of FIG. 4D, when a specific touch is applied to the preset input screen 14 in a specific direction (for example, touches simultaneously applied to at least two points spaced apart from one another are dragged in a specific direction), the control unit 180 may move the preset input screen 14 to correspond to the specific direction.

[0127] Thus as illustrated in the fourth drawing of FIG. 4D, the preset input screen 14 may be moved to an upper end of the touch screen to correspond to the direction (direction toward the upper end of the touch screen) of the specific touch, so as to be output.

[0128] In this manner, the user may variously form an output state of the preset input screen by adjusting strength or duration time of an input outside of the terminal body. Also, the user may change an output state of the preset input screen, which is already output, by using various inputs, and thus, user convenience may be enhanced.

[0129] Meanwhile, the preset input screen may be output on the assumption that the specific mode is maintained in an activated state. That is, output of the preset input screen may be maintained only for a preset period of time, and when the preset period of time has lapsed, the output of the preset input screen may be terminated.

[0130] FIGS. 5A, 5B, and 5C are views illustrating embodiments regarding activation of preset input screens.

[0131] First, referring to FIG. 5A, a preset input screen 15a may be output on at least a portion of the touch screen 151, and information 21 input by the user may be displayed in the preset input screen 15a.

[0132] The control unit 180 may change an output state of the preset input screen over time. In detail, the control unit 180 may control the touch screen 151 such that at least one of a size and transparency of the preset input screen is changed over time within the preset period of time.

[0133] That is, as illustrated in the second drawing of FIG. 5A, the control unit 180 may control the touch screen 151 such that the preset input screen 15a is changed to an input screen 15b having a smaller size with the lapse of a specific time within the preset period of time.

[0134] In this state, when the specific period of time has further lapsed, the control unit 180 may control the touch screen 151 such that an input screen 15c having a size smaller than that of the input screen 15b is output as illustrated in the third drawing of FIG. 5A.

[0135] As the size of the preset input screen is changed in this manner, a size of information 21 input by the user may also be changed to correspond thereto so as to be displayed. Alternatively, as the size of the preset input screen is changed, outputting of at least a portion of the input information may be terminated.

[0136] Also, when the preset period of time has lapsed, the control unit 180 may control the touch screen 151 such that outputting of the preset input screen is terminated. In a case in which outputting of the preset input screen is terminated as the preset period of time has lapsed, image information corresponding to the preset input screen including the input information may be stored. Also, the control unit 180 may output information 1 regarding storing of the image information on one region of the touch screen 151 as illustrated in the fourth drawing of FIG. 5A.

[0137] Meanwhile, although not shown, in a case in which a preset condition is met (for example, in a case

in which a specific input is applied from the user) before outputting of the preset input screen is terminated, the control unit 180 may immediately terminate outputting of the preset input screen and store the image information corresponding to the preset input screen.

[0138] That is, when a specific movement of the terminal body is sensed or when a specific input is received through the microphone 122, the control unit 180 may determine whether the preset condition is met.

[0139] Meanwhile, in a case in which a specific input is received through the microphone 122 before the preset period of time has lapsed, the control unit 180 may maintain outputting of the preset input screen.

[0140] That is, referring to the first and second drawings of FIG. 5B, the size of the preset input screen may be gradually decreased over time within the preset period of time. Also, as illustrated in the third drawing of FIG. 5B, in a state in which a preset input screen 15c having a reduced size is output on the touch screen 151, a specific input may be received through the microphone 122.

[0141] Here, the specific input may be the same as an input outside of the terminal body corresponding to a change in vibration of air having a preset pattern. In this case, the control unit 180 may calculate again the preset period of time, starting from a point at which the specific input is received. That is, the control unit 180 may control the touch screen 151 such that outputting of the preset input screen is maintained for the preset period of time, starting from a point in time at which the specific input is received.

[0142] As illustrated in the fourth drawing of FIG. 5B, the control unit 180 may control the touch screen 151 such that the reduced input screen 15c is changed to the preset input screen 15a having the initial output size and transparency. Thus, the user may visually check that a time for activating the preset input screen has been extended through the preset input screen output to have the extended size.

[0143] Although not shown, the information displayed on the preset input screen may be corrected or deleted on the basis of a specific input. For example, when a touch gesture (a touch gesture of dragging horizontally) of deleting the information displayed on the preset input screen is applied, the control unit 180 may control the touch screen 151 such that at least a portion of the information corresponding to the region to which the touch has been applied is deleted.

[0144] Thus, the user may extend the activated state of the preset input screen by applying a specific input, and may input additional new information to the preset input screen or may correct the displayed information.

[0145] Meanwhile, the control method according to an embodiment of the present disclosure may also be applied to the wearable device 300 illustrated in FIG. 2. For example, when the control method according to an embodiment of the present disclosure is applied to the wearable watch 300, the preset input screen may be output on at least a portion of the touch screen 351 included in the wearable watch 300.

[0146] That is, as illustrated in FIG. 5C, when a specific movement of the main body of the wearable watch 300 is sensed, the microphone 322 is activated and an external input corresponding to a change in vibration of air having a preset pattern may be received through the microphone 322. Also, a standby screen 2 of the touch screen 351 of the wearable watch 300 may be output.

[0147] Here, as illustrated in the first drawing of FIG. 5C, when an external input corresponding to a change in vibration of air having a preset pattern is received through the microphone 322, the specific mode is activated, and as illustrated in the second drawing of FIG. 5C, a preset input screen 10'a may be output on at least a portion of the touch screen 151.

[0148] Also, the control unit of the wearable watch 300 may control the touch screen 351 such that outputting of the preset input screen 10' is maintained only for a preset period of time in which the activated state of the specific mode is maintained. The control unit of the wearable watch 300 may control the touch screen 351 such that at least one of transparency and a size of the preset input screen 10'a over time within the preset period of time.

[0149] Thus, as illustrated in the third drawing of FIG. 5C, the preset input screen 10'a may be changed to an input screen 10b' having a reduced size. Here, as illustrated in the third drawing of FIG. 5C, a specific touch may be applied to the touch screen 351 in a preset direction (a rotational touch gesture applied along the circumference of the touch screen). In this case, the control unit of the wearable watch 300 may start again the preset period of time from a point in time at which the specific touch is applied.

[0150] That is, as illustrated in the fourth drawing of FIG. 5C, the control unit of the wearable watch 300 may control the touch screen 351 such that the reduced input screen 10'b is changed to the preset input screen 10'a at a point in time at which the specific touch is applied.

[0151] In this manner, when the control method of the present disclosure is applied to the wearable watch 300, a specific touch for maintaining outputting of the preset input screen may be utilized in consideration of a form of the touch screen 351.

[0152] Hereinafter, another embodiment in which information input from the user is displayed on the preset input screen will be described with reference to FIGS. 6A and 6B.

[0153] FIGS. 6A and 6B are views illustrating embodiments in which information input by a user is displayed on a preset input screen.

[0154] First, referring to FIG. 6A, screen information 30 may be output on the touch screen 151. Here, the screen information 30 may be any type of screen that may be output on the touch screen 151. For example, the screen information may include a home screen page, a lock screen, or an execution screen of a specific application.

[0155] In this manner, in a state in which the screen

information 30 is output on the touch screen 151, when a specific movement of the terminal body is sensed, the microphone 122 is activated, and an external input corresponding to a change in vibration of air having a preset pattern may be received through the microphone 122.

[0156] In this case, on the basis of the received external input, the control unit 180 may output a preset input screen 17 in at least one region of the screen information 30 in an overlapping manner. Also, the preset input screen 17 may be output with preset transparency such that the preset input screen 17 does not cover at least one region of the screen information 30.

[0157] In this manner, in a state in which the preset input screen 17 is output, as illustrated in the third drawing of FIG. 6A, a voice input may be received through the microphone 122. The control unit 180 may analyze the voice input and display information formed on the basis of the voice input on the preset input screen 17. In this case, as illustrated in the fourth drawing of FIG. 6A, the control unit 180 may control the touch screen 151 such that the information formed on the basis of the voice input is displayed in a preset letter form.

[0158] Here, the control unit 180 may control the touch screen 151 to display the formed information such that transparency of a portion corresponding to a region in which the formed information is displayed is changed on the preset input screen 17. For example, the control unit 180 may adjust transparency of the portion corresponding to the region in which the formed information is displayed is 100 in the preset input screen.

[0159] Thus, the user may be provided with a visual effect that he or she may check at least a portion of the screen information through the portion corresponding to the region in which the formed information is displayed in the preset input screen.

[0160] In a state in which the preset input screen 11' is output on the touch screen 351 of the wearable watch 300 as illustrated in FIG. 6B, when a touch input is applied to the touch screen 351 as illustrated in the third drawing of FIG. 6B, the formed information may be displayed to correspond to the touch input on the basis of the touch input.

[0161] Here, the control unit of the wearable watch 300 may control the touch screen 351 such that the formed information having a size smaller than that displayed to correspond to the touch input is input to the preset input screen 11'. For example, as illustrated in the fourth drawing of FIG. 6B, the control unit of the wearable watch 300 may control the touch screen 151 such that the formed information having a preset size is input on the preset input screen 11'.

[0162] That is, in a case in which information is input on the touch screen having a small size, such as the wearable watch 300, by using a touch input, the user may input information by utilizing the entire region of the touch screen. Also, the control unit of the wearable watch 300 may display previously input information in a reduced size on the preset input screen to provide user convenience such that the user may continuously input information.

[0163] As described above, when the specific mode is activated in a state in which screen information is output on the touch screen 151 of the mobile terminal 100, a preset input screen having preset transparency may be output on at least one region of the screen information in an overlapping manner. That is, the user may be provided with convenience such that he or she may utilize the specific mode without being interfered in using the screen information.

[0164] FIGS. 7A, 7B, and 7C are views illustrating embodiments regarding activation of a specific mode in a state in which screen information is output.

[0165] First, referring to FIG. 7A, an execution screen 31 of a messenger application may be output on the touch screen 151 of the mobile terminal 100. In this state, in a case in which an input for activating the specific mode is input through the microphone 122, a preset input screen 18a may be output on an execution screen 23 of the application in an overlapping manner.

[0166] Also, after the information 23 formed on the basis of a user's touch input is displayed on the input screen 18a, as illustrated in the third drawing of FIG. 7A, a specific input may be received by the microphone 122. Here, the specific input may correspond to an input outside of the terminal body for activating the specific mode. However, the present disclosure is not limited thereto and the specific input may correspond to a sound event not including a meaning such as a specific phoneme or syllable or a voice event including a specific keyword.

[0167] In this manner, when the specific input is received through the microphone 122, the control unit 180 may process image information corresponding to the preset input screen 18a by associating the image information to an execution screen 31 of the messenger application.

[0168] In detail, when the specific input is received, the control unit 180 may store image information corresponding to the preset input screen 18a. Also, the control unit 1 80 may control the wireless communication unit 110 to transmit the stored image information to the external terminal by using information corresponding to the external terminal included in the execution screen 31 of the messenger application.

[0169] In a case in which the execution screen 31 of the messenger application corresponds to a function for transmitting information to the external terminal in real time, the control unit 180 may transmit the stored image information to the external terminal and control the touch screen 151 such that the stored image information is included in the execution screen 31 of the messenger application.

[0170] Here, outputting of the stored image information 31a included in the execution screen 31 of the messenger application may be maintained for a preset period of time. That is, when the preset period of time has expired, the control unit 180 may control the touch screen 151 to terminate outputting of the stored image information as il-

lustrated in the fifth drawing of FIG. 7A. Thus, as illustrated in the sixth drawing of FIG. 7A, after the outputting of the stored image information is terminated, only the execution screen 31 of the messenger application may be output on the touch screen 151.

[0171] In this manner, in addition to inputting and storing information by utilizing the specific mode, information stored by the specific mode may be processed by associating it with a function being executed when the specific mode is activated. Also, since an output state of the stored information is maintained only for a preset period of time, it may provide various visual funs to the user.

[0172] Also, the control unit 180 may store the screen information being output on the touch screen 151 and the image information corresponding to the preset input screen together. That is, as illustrated in FIG. 7B, an execution screen 32 of a map application may be output on the touch screen 151.

[0173] In this state, as illustrated in the first drawing of FIG . 7B, the specific mode may be activated on the basis of an input received by the microphone 122, and as illustrated in the second drawing of FIG. 7B, a preset input screen 18b may be output to overlap with preset transparency on the execution screen 32 of the map application. Also, information 24 formed on the basis of a user input may be displayed on the preset input screen 18b.

[0174] Here, the control unit 180 may output a specific window 32a including menu information related to a function to one region of the touch screen 151 as illustrated in the third drawing of FIG. 7B. Here, the menu information related to the function may be menu information regarding a function that may be processed in relation to image information corresponding to the execution screen 32 and the preset input screen 18b.

[0175] In a case in which the user selects one menu information 33a as illustrated in the third drawing of FIG. 7B, the control unit 180 may associate the function corresponding to the one menu information 33a and the image information and process the same.

[0176] In detail, the control unit 180 may execute a function corresponding to the one menu information 33a, and as illustrated in the fourth drawing of FIG. 7B, the control unit 180 may change the execution screen 32 to the execution screen 33 of the function corresponding to the one menu information 33a and output the same. Also, after the image information corresponding to the preset input screen 18b is stored, the image information may be used for executing the one menu information 33a. That is, as illustrated in the fourth drawing of FIG. 7B, the control unit 180 may include the image information 33b in the execution screen 33 of the one menu information 33a.

[0177] In FIG. 7B, an embodiment in which, after the formed information is displayed on the preset input screen, a specific window including the menu information is output before the outputting of the preset input screen is terminated is illustrated. However, it may be set such that the preset input screen may be output when a specific condition is met (for example, in a case in which an additional input is applied from the user).

[0178] Meanwhile, on the basis of a user input received before outputting of the preset input screen is terminated, the control unit 180 may store image information corresponding to the preset input screen differently.

[0179] In detail, when a preset type of first user input is received, the control unit 180 may store only image information corresponding to the preset input screen. Alternatively, when a preset type second user input is received, the control unit 180 may store image information corresponding to the preset input screen and at least a portion of the screen information output on the touch screen 151.

[0180] Here, the user input may be received by at least one of the microphone 122, the touch screen 151, and the sensing unit 140. For example, the case may include a case in which a specific sound event is received through the microphone 122, a case in which a specific touch is applied to the preset input screen, or a case in which a specific movement of the terminal body or a specific movement with respect to the terminal body is sensed by the sensing unit 140.

[0181] Thus, in a case in which the specific mode is used while a specific function related to the screen information output on the touch screen 151 is being executed, the user may separately store only the formed image information or associate the image information with the screen information and store the same on the basis of the specific mode by applying various user inputs.

[0182] Meanwhile, in addition to the transmission of the stored image information to the external terminal in a state in which inputting of information to the preset input screen is completed, image information corresponding to the input screen may be transmitted to the external terminal in real time while information is being input to the preset input screen.

[0183] That is, referring to FIG. 7C, a video call function may be executed in the mobile terminal 100, and an execution screen 34 corresponding to the video call function may be output on the touch screen 151. Here, as illustrated in the first drawing of FIG. 7C, when the specific mode is activated on the basis of an input outside of the terminal body received through the microphone 122, as illustrated in the second drawing of FIG. 7C, a preset input screen 18c may be output on the execution screen 34 of the video call function in an overlapping manner.

[0184] Also, the control unit 180 may transmit a control command to a counterpart terminal 200 of the video call function such that an output screen 18c' corresponding to the preset input screen 18c is displayed on the counterpart terminal 200 to correspond to the output of the preset input screen 18c. That is, the control command may be a control command for outputting image information corresponding to the preset input screen 18c on a touch screen 251 of the counterpart terminal 200.

[0185] In this manner, after the control command is transmitted to the counterpart terminal 200, when the

formed information 25 is displayed on the preset input screen 18c on the basis of a touch applied to the touch screen 151, the control unit 180 may transmit a control command corresponding to the display of the formed information 25 to the counterpart terminal 200.

[0186] Thus, as illustrated in the third drawing of FIG. 7C, an output screen 18'c on which the information 25' is formed on the basis of the touch may be displayed to overlap on the execution screen 34' of the video call function in the touch screen 251 of the counterpart terminal 200.

[0187] In this manner, image information corresponding to the preset input screen in a state in which the formed information is displayed on the preset input screen may be shared with the external terminal. Also, image information corresponding to the preset input screen in a state in which the information formed by the user is displayed on the preset input screen may be shared in real time with the external terminal. Thus, the user may freely share various types of image information with the external terminal by utilizing the specific mode.

[0188] In this manner, after pieces of image information corresponding to the preset input screen formed in a state in which the specific mode is activated are stored, the image information may be output again according to an output request from the user. Here, in a case in which the stored pieces of image information are output, the control unit 180 may control the touch screen 151 to output the image information on the basis of a visual effect applied to the preset input screen.

[0189] In a specific example, after handwriting information on the basis of a specific touch is displayed on the preset input screen, image information corresponding to the preset input screen may be stored and the image information may be output according to an output request from the user. In this case, the control unit 180 may output the image information on the basis of a visual effect applied in the process of inputting the handwriting information.

[0190] For example, in a case in which the handwriting information is input on the basis of a drag touch applied from the left side to the right side, a visual effect of handwriting information formed from the left side to the right side may be applied to the image information output on the basis of the output request so as to be output.

[0191] That is, the image information corresponding to the preset input screen may be an image file in which an image is moved for a preset period of time. For example, the image information corresponding to the preset input screen may be formed as a graphics interchange format (GIF). Meanwhile, image information (still image) corresponding to the preset input screen in a state in which input of handwriting information is completed may be output.

[0192] On the basis of a user request, the control unit 180 may output a separate list screen storing pieces of image information formed by the specific mode. The separate list screen may be output on the basis of execution of an application corresponding to a function of storing image information such as a gallery application, for example.

[0193] Hereinafter, embodiments related to outputting of pieces of stored image information on the basis of the specific mode will be described with reference to FIGS. 8A and 8B.

[0194] FIGS. 8A and 8B are views illustrating embodiments related to outputting stored image information by activating a specific mode.

[0195] First, referring to FIG. 8A, a list screen 35 regarding the stored image information may be output on the touch screen 151 according to a user request. Here, as illustrated in the second drawing of FIG. 8A, a touch input for selecting one list 35a included in the list screen 35 may be received.

[0196] On the basis of the application of the touch input, as illustrated in the third drawing of FIG. 8A, image information 35b corresponding to the one list 35a may be output on the touch screen 151. Here, the image information 35b may be image information stored in a state in which an input screen formed on the basis of the specific mode overlaps a specific image, for example. In this case, the control unit 180 may control the touch screen 151 such that an input screen in which a specific visual effect is applied to the specific image is output on the basis of the specific visual effect.

[0197] Also, the control unit 180 may control the touch screen 151 such that information 35c regarding an output time of the input screen included in the image information 35b is output to one region of the touch screen 151. Thus, the user may be provided with information regarding an output time of the input screen output on the basis of the specific visual effect.

[0198] Meanwhile, when storing image information corresponding to the preset input screen, the user may set security with respect to the image information. For example, the user may store the image information together with specific authentication information (for example, iris information or fingerprint information). In this case, the control unit 180 may determine whether to output the image information on the assumption that an authentication function is performed on the basis of the specific authentication information.

[0199] That is, in a case in which authentication information input by the user is identical to the specific authentication information, the control unit 180 may control the touch screen 151 to output the image information. However, in a case in which the authentication information input from the user is identical to the specific authentication information, the control unit 180 may control the touch screen 151 to output the image information. However, in a case in which the authentication information input from the user is not identical to the specific authentication information, the control unit 180 may control the touch screen 151 to limit outputting of the image information.

[0200] Also, the control unit 180 may limit displaying

of a portion of pieces of image information with security set by the user in the list screen regarding the stored pieces of image information. That is, as illustrated in the first drawing of FIG. 8B, a list screen 35 regarding a plurality of pieces of image information may be output on the touch screen 151. Also, the plurality of pieces of image information included in the list screen 35 may be displayed on the basis of the same scheme.

[0201] In this state, when there is an output request regarding the pieces of image information with set security together with inputting of authentication information from the user, the control unit 180 may determine whether the authentication information input to correspond to the output request is identical to previously stored authentication information. Here, the output request may be application of a specific input through the microphone 122, while inputting fingerprint information to a portion of the main body of the mobile terminal 100 (rear input unit) as illustrated in the second drawing of FIG. 8B, for example.

[0202] In a case in which the input authentication information is identical to the previously stored authentication information, as illustrated in the third drawing of FIG. 8B, the control unit 180 may control the touch screen 151 such that only pieces of image information corresponding to the input authentication information are changed to the displayed screen 36.

[0203] In this manner, the user may selectively limit outputting of at least a portion of the pieces of image information formed on the basis of the specific mode by utilizing authentication information.

[0204] In the mobile terminal according to an embodiment of the present disclosure, when the microphone is activated in a specific manner and a preset input is applied to the microphone, a mode for receiving a touch and voice information formed by the user by applying a specific visual effect thereto may be executed. Also, the specific visual effect may be variously applied on the basis of the preset input applied through the microphone.

[0205] Thus, the user may form a memo to which various and funny visual effects are applied by variously applying the preset input.

[0206] The present invention described above may be implemented as a computer-readable code in a medium in which a program is recorded. The computer-readable medium includes any type of recording device in which data that can be read by a computer system is stored. The computer-readable medium may be, for example, a hard disk drive (HDD), a solid state disk (SSD), a silicon disk drive (SDD), a ROM, a RAM, a CD-ROM, a magnetic tape, a floppy disk, an optical data storage device, and the like. The computer-readable medium also includes implementations in the form of carrier waves (e.g., transmission via the Internet). Also, the computer may include the controller 180 of the terminal. Thus, the foregoing detailed description should not be interpreted limitedly in every aspect and should be considered to be illustrative. The scope of the present invention should be determined by reasonable interpretations of the attached claims and every modification within the equivalent range are included in the scope of the present invention.

[0207] The foregoing embodiments and advantages are merely exemplary and are not to be considered as limiting the present disclosure. The present teachings can be readily applied to other types of apparatuses. This description is intended to be illustrative, and not to limit the scope of the claims. Many alternatives, modifications, and variations will be apparent to those skilled in the art. The features, structures, methods, and other characteristics of the exemplary embodiments described herein may be combined in various ways to obtain additional and/or alternative exemplary embodiments.

[0208] As the present features may be embodied in several forms without departing from the characteristics thereof, it should also be understood that the above-described embodiments are not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be considered broadly within its scope as defined in the appended claims, and therefore all changes and modifications that fall within the metes and bounds of the claims, or equivalents of such metes and bounds are therefore intended to be embraced by the appended claims.

Claims

1. A mobile terminal comprising:

a terminal body;
a microphone coupled to the terminal body and configured to receive an external input;
a sensor configured to sense movement of the terminal body; and
a controller configured to:

activate the microphone in response to a specific movement of the terminal body sensed by the sensor; and
activate a specific mode when the external input received via the activated microphone comprises vibration of air having a preset pattern.

2. The mobile terminal of claim 1, further comprising:

a touch screen coupled to the terminal body,
wherein the specific mode is a mode in which information, generated in response to at least one of a touch input applied to the touch screen or a voice input received via the microphone, is output.

3. The mobile terminal of claim 2, wherein:

the specific mode is maintained in an activated state for a preset period of time; and

the controller is further configured to cause the touch screen to display a preset input screen for displaying the generated information via at least a portion of the touch screen in response to the activation of the specific mode.

4. The mobile terminal of claim 3, wherein the controller is further configured to cause the touch screen to:

change at least one of a size or a transparency of the preset input screen over time; and
terminate the displaying of the preset input screen when the preset period of time lapses.

5. The mobile terminal of claim 4, wherein the controller is further configured to cause the touch screen to continue the displaying of the preset input screen for the preset period of time, starting from a point in time at which a specific input is received, in response to the specific input that is received via the microphone before the preset period of time lapses.

6. The mobile terminal of claim 4, further comprising a memory,
wherein the controller is further configured to:

cause the touch screen to display the generated information on the preset input screen; and
cause the memory to store image information corresponding to at least a portion of the preset input screen when a preset condition is met prior to the termination of the displaying of the preset input screen.

7. The mobile terminal of claim 6, wherein the preset condition is related to at least one of receiving a specific input via the microphone, a lapse of the preset period of time, or sensing a specific movement of the terminal body by the sensor.

8. The mobile terminal of claim 6, wherein the controller is further configured to cause the touch screen to:

display the image information in response to a user input; and
terminate the displaying of the image information when the preset period of time lapses.

9. The mobile terminal of claim 8, wherein:

the image information is specific image information stored with preset authentication information; and
the controller is further configured to:

limit displaying of a portion of the specific image information; and
cause the touch screen to display a remaining portion of the specific image information other than the portion of the specific image information in response to a specific input received via the microphone.

10. The mobile terminal of claim 2, wherein the controller is further configured to switch at least a portion of the touch screen from a deactivated state to an activated state when the specific mode is activated in response to the external input received while the touch screen is in the deactivated state in which lighting is turned off.

11. The mobile terminal of claim 3, wherein:

the vibration of air having the preset pattern is caused by a puff or breath of a user; and
the controller is further configured to adjust a display size of the preset input screen based on at least one of a strength of the vibration of air or a time duration for which the external input is received.

12. The mobile terminal of claim 3, wherein the controller is further configured to cause the touch screen to display the preset input screen at a position corresponding to one point on the touch screen in response to the external input received while a touch is applied to the one point of the touch screen.

13. The mobile terminal of claim 3, wherein the controller is further configured to cause the touch screen to:

display screen information; and
display the preset input screen having a preset transparency on at least a portion of the screen information in an overlapping manner.

14. The mobile terminal of claim 13, wherein the controller is further configured to cause the touch screen to change a transparency of the portion of the touch screen in which the generated information is displayed when the generated information is displayed on the preset input screen.

15. The mobile terminal of claim 13, further comprising a memory,
wherein the controller is further configured to cause the memory to:

store image information corresponding to the preset input screen in response to a first type of user input; and
store image information corresponding to the preset input screen and at least a portion of the screen information in response to a second type of user input,

wherein the first and second type of user inputs are received via at least one of the microphone, the touch screen, or the sensor.

FIG. 1A

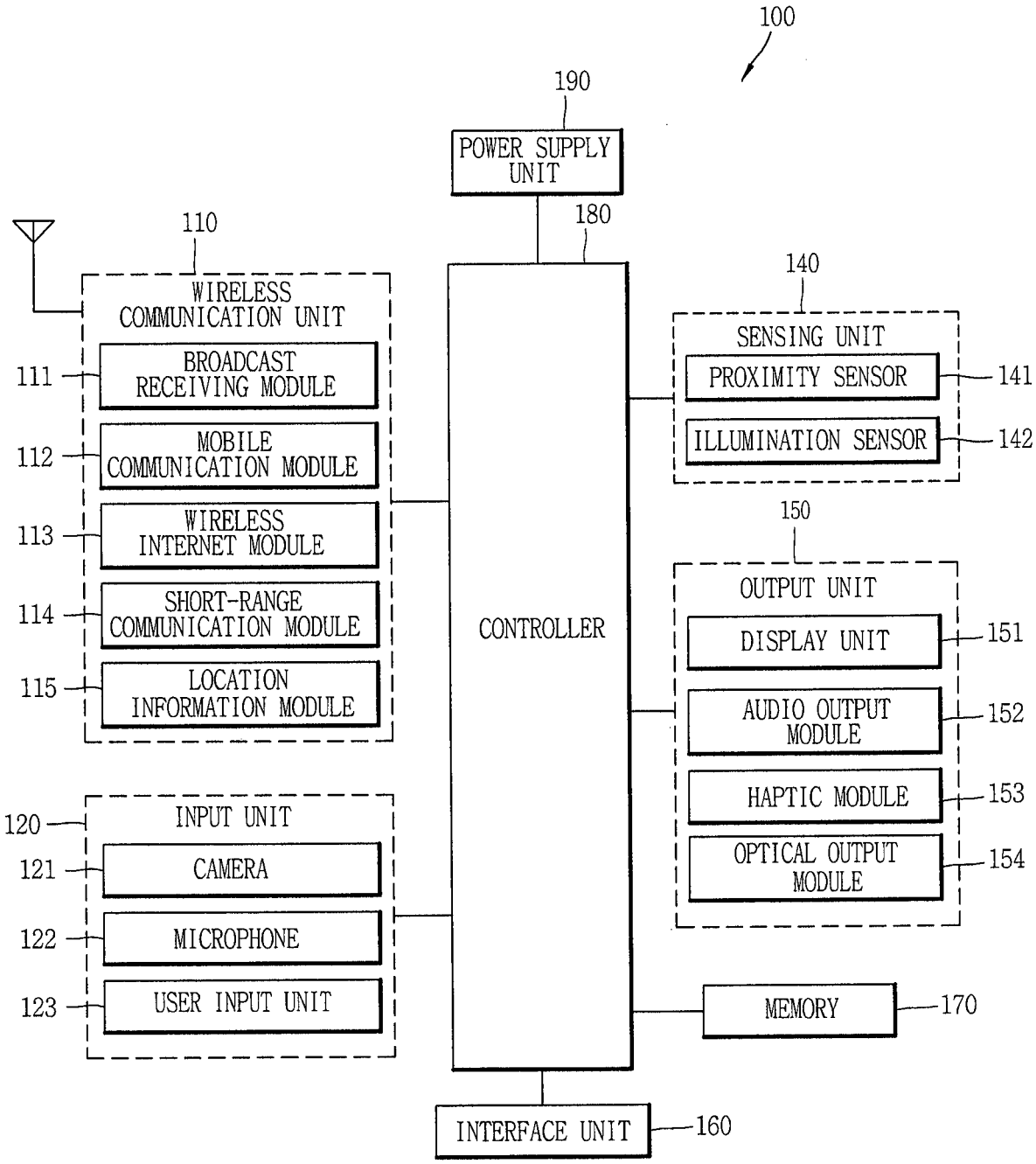

100
190
POWER SUPPLY UNIT
180
110
WIRELESS COMMUNICATION UNIT
111
BROADCAST RECEIVING MODULE
112
MOBILE COMMUNICATION MODULE
113
WIRELESS INTERNET MODULE
114
SHORT-RANGE COMMUNICATION MODULE
115
LOCATION INFORMATION MODULE
120
INPUT UNIT
121
CAMERA
122
MICROPHONE
123
USER INPUT UNIT
CONTROLLER
140
SENSING UNIT
PROXIMITY SENSOR
141
ILLUMINATION SENSOR
142
150
OUTPUT UNIT
DISPLAY UNIT
151
AUDIO OUTPUT MODULE
152
HAPTIC MODULE
153
OPTICAL OUTPUT MODULE
154
MEMORY
170
INTERFACE UNIT
160

FIG. 1B

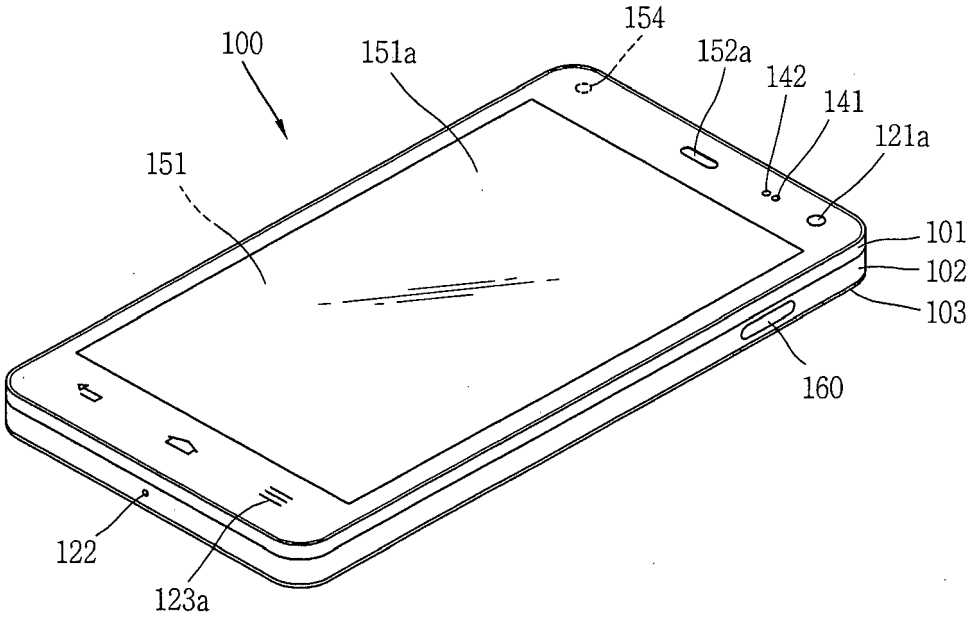

100
151a
154
152a
142
141
121a
151
101
102
103
160
122
123a

FIG. 1C

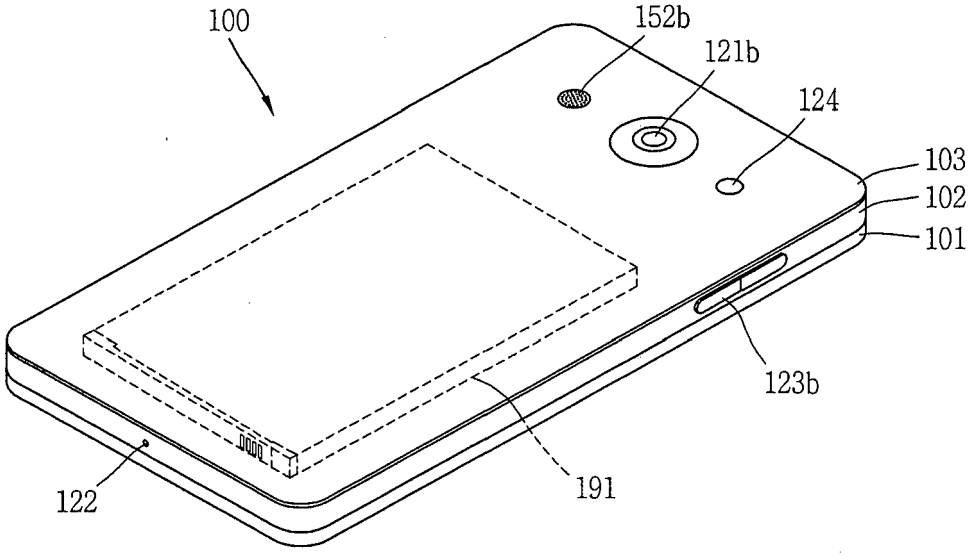

100
152b
121b
124
103
102
101
123b
191
122

FIG. 2

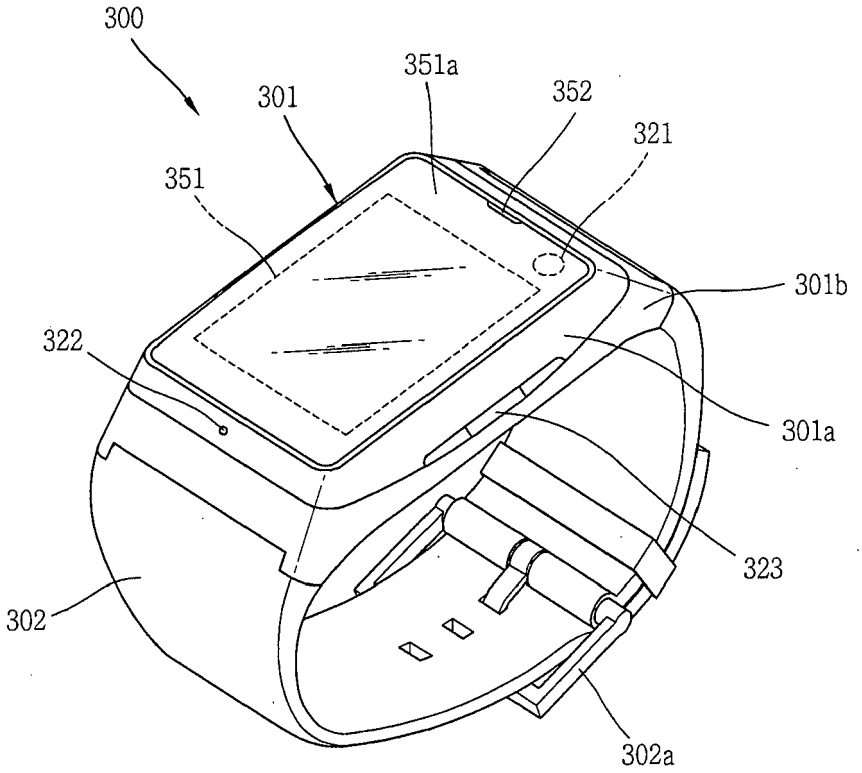


FIG. 3A

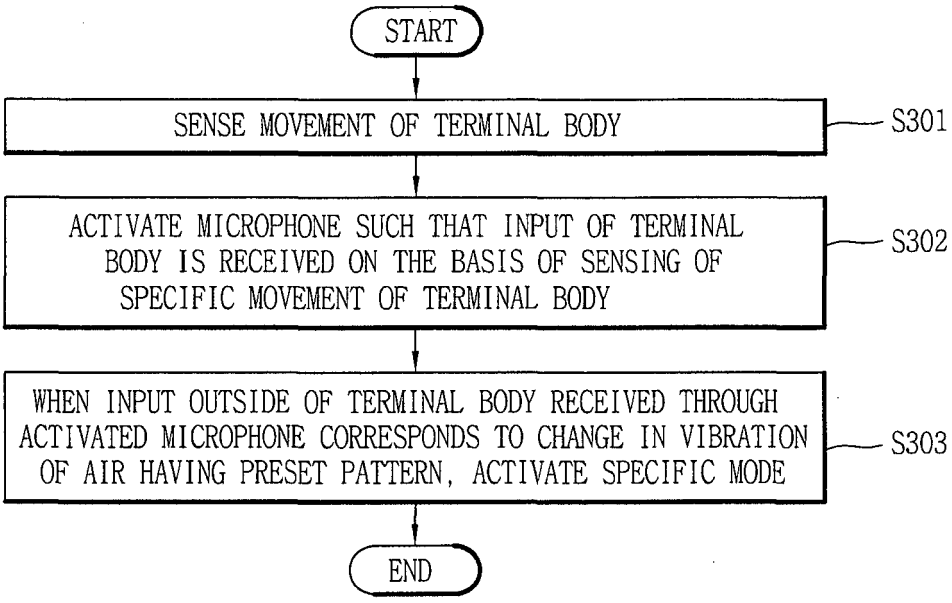

START
SENSE MOVEMENT OF TERMINAL BODY
S301
ACTIVATE MICROPHONE SUCH THAT INPUT OF TERMINAL BODY IS RECEIVED ON THE BASIS OF SENSING OF SPECIFIC MOVEMENT OF TERMINAL BODY
S302
WHEN INPUT OUTSIDE OF TERMINAL BODY RECEIVED THROUGH ACTIVATED MICROPHONE CORRESPONDS TO CHANGE IN VIBRATION OF AIR HAVING PRESET PATTERN, ACTIVATE SPECIFIC MODE
S303
END

FIG. 3B

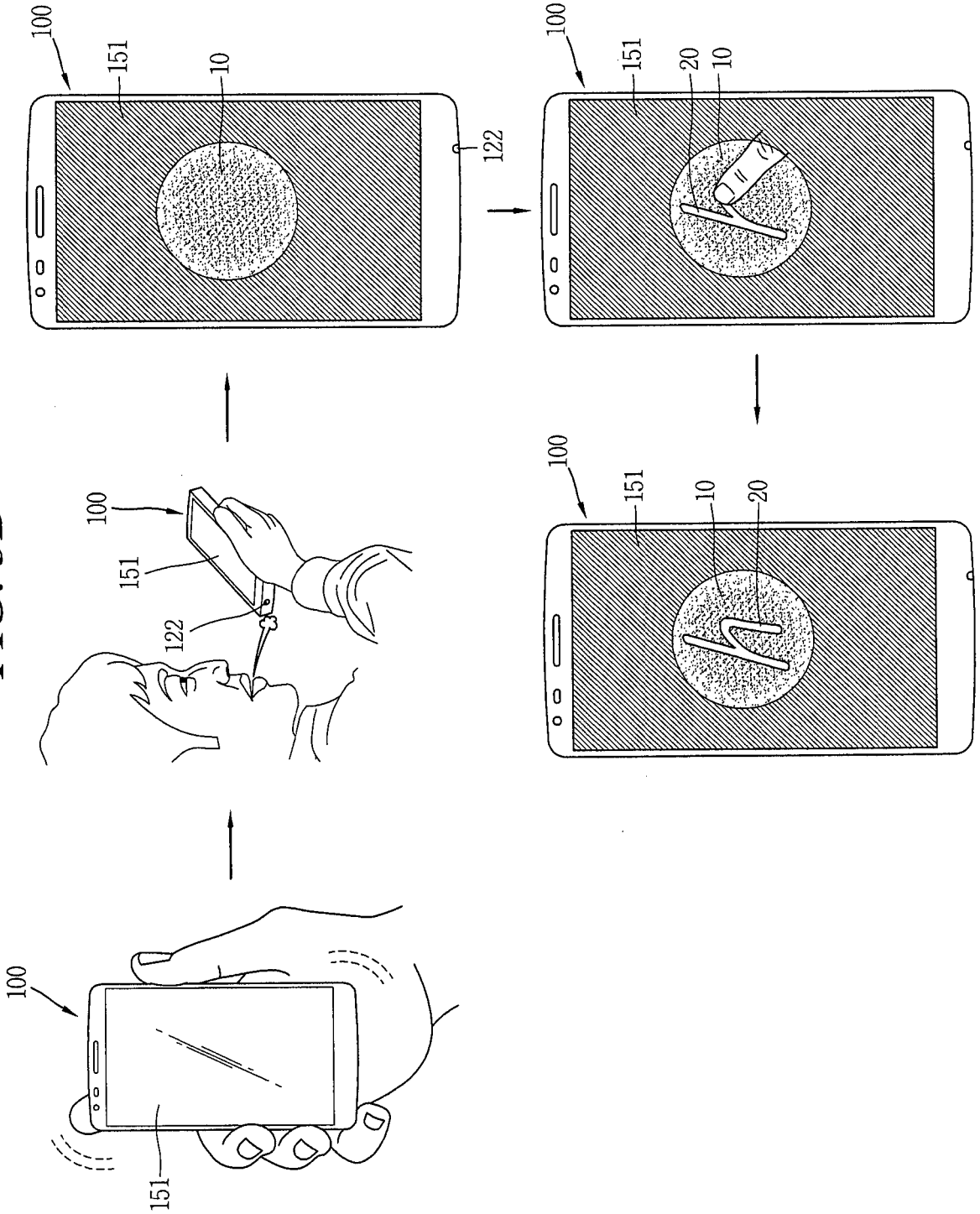


FIG. 4A

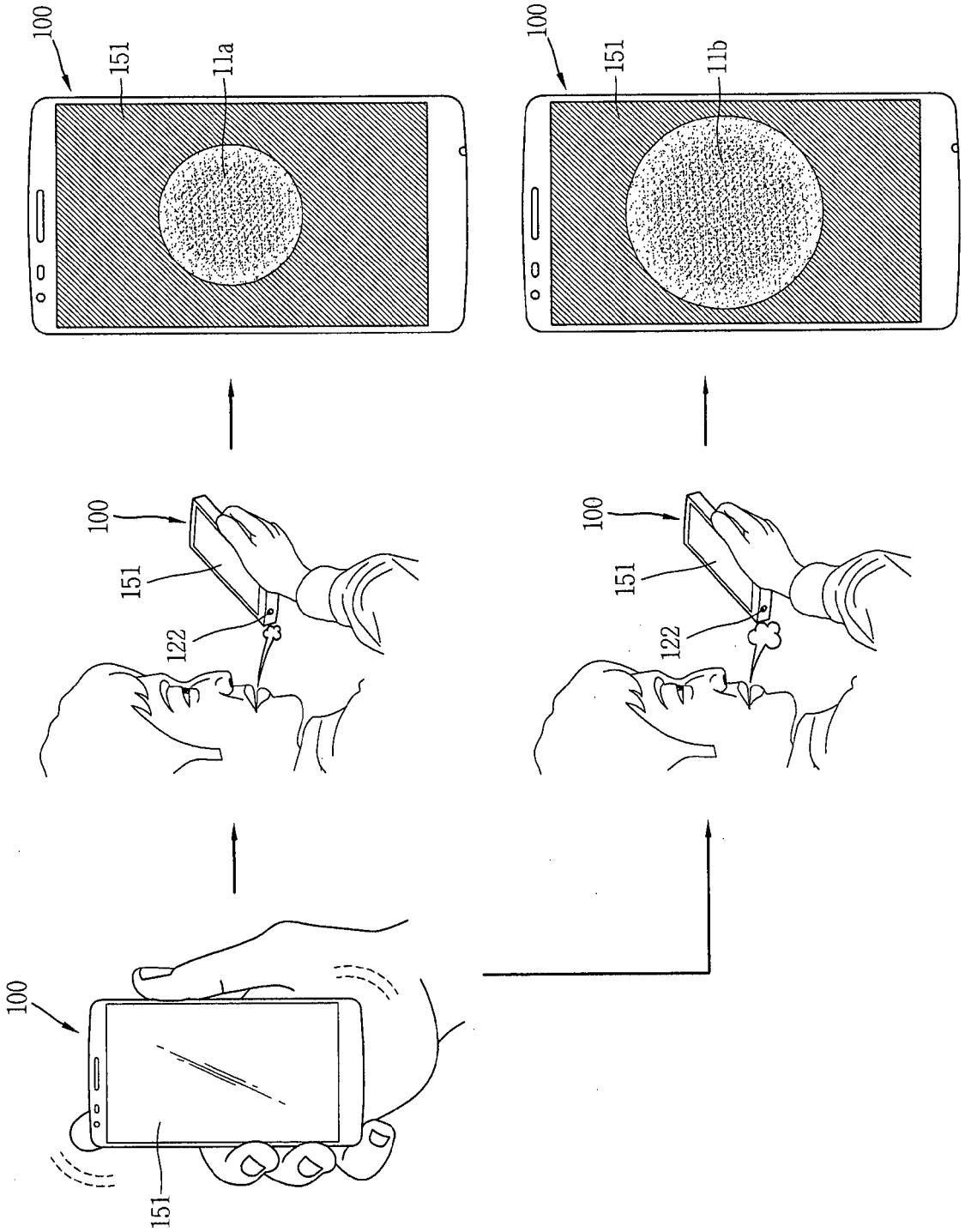
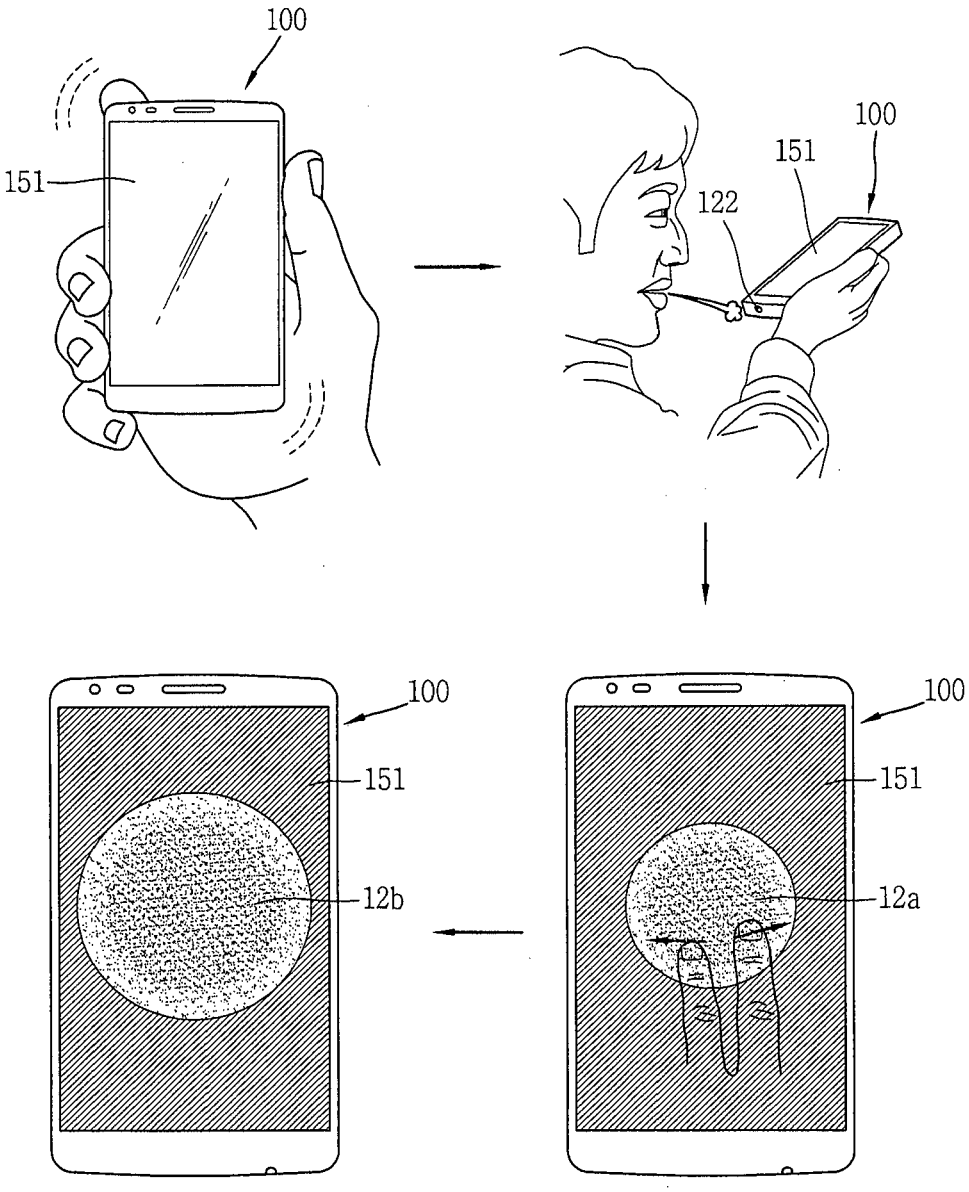


FIG. 4B



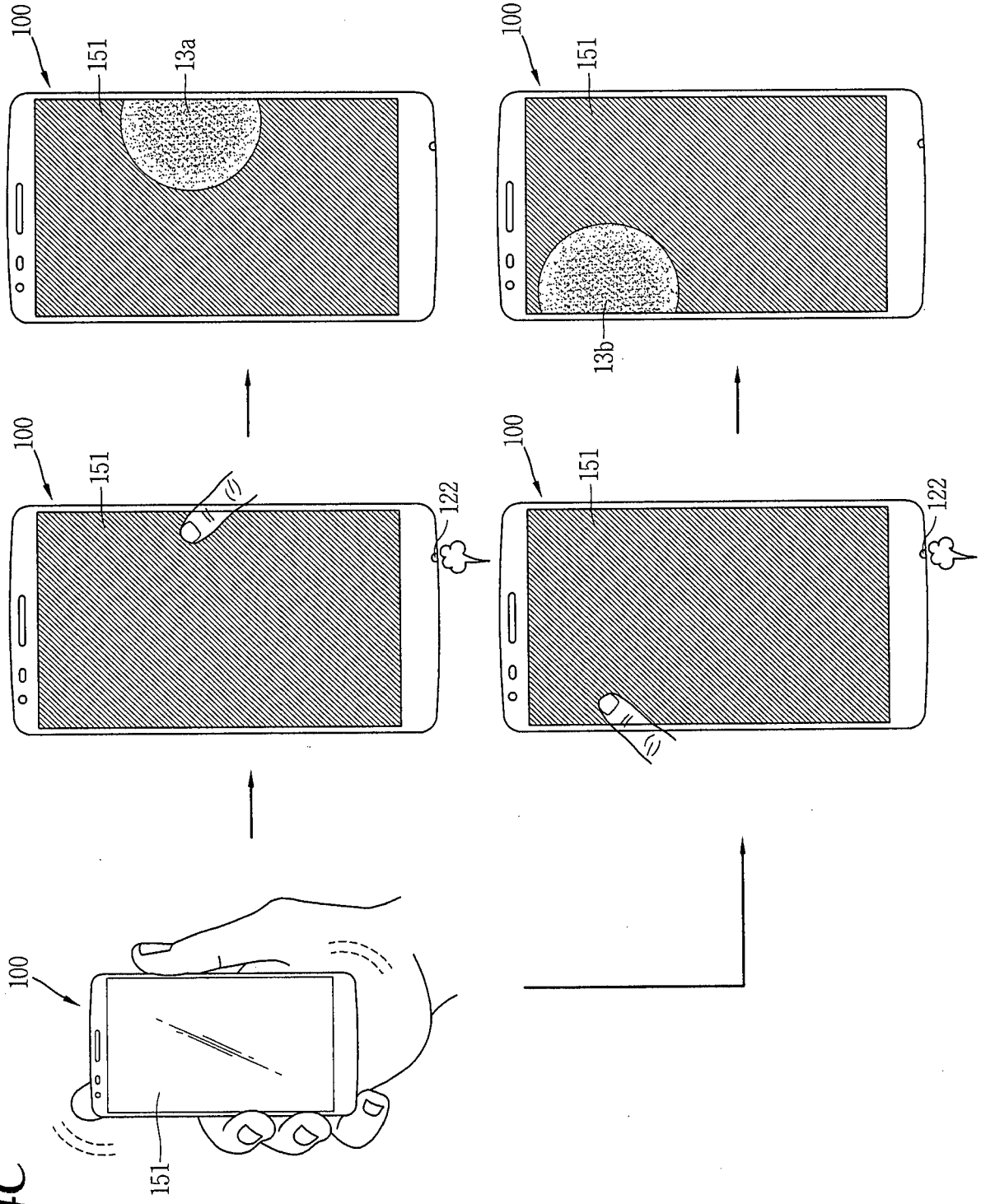


FIG. 4C

FIG. 4D

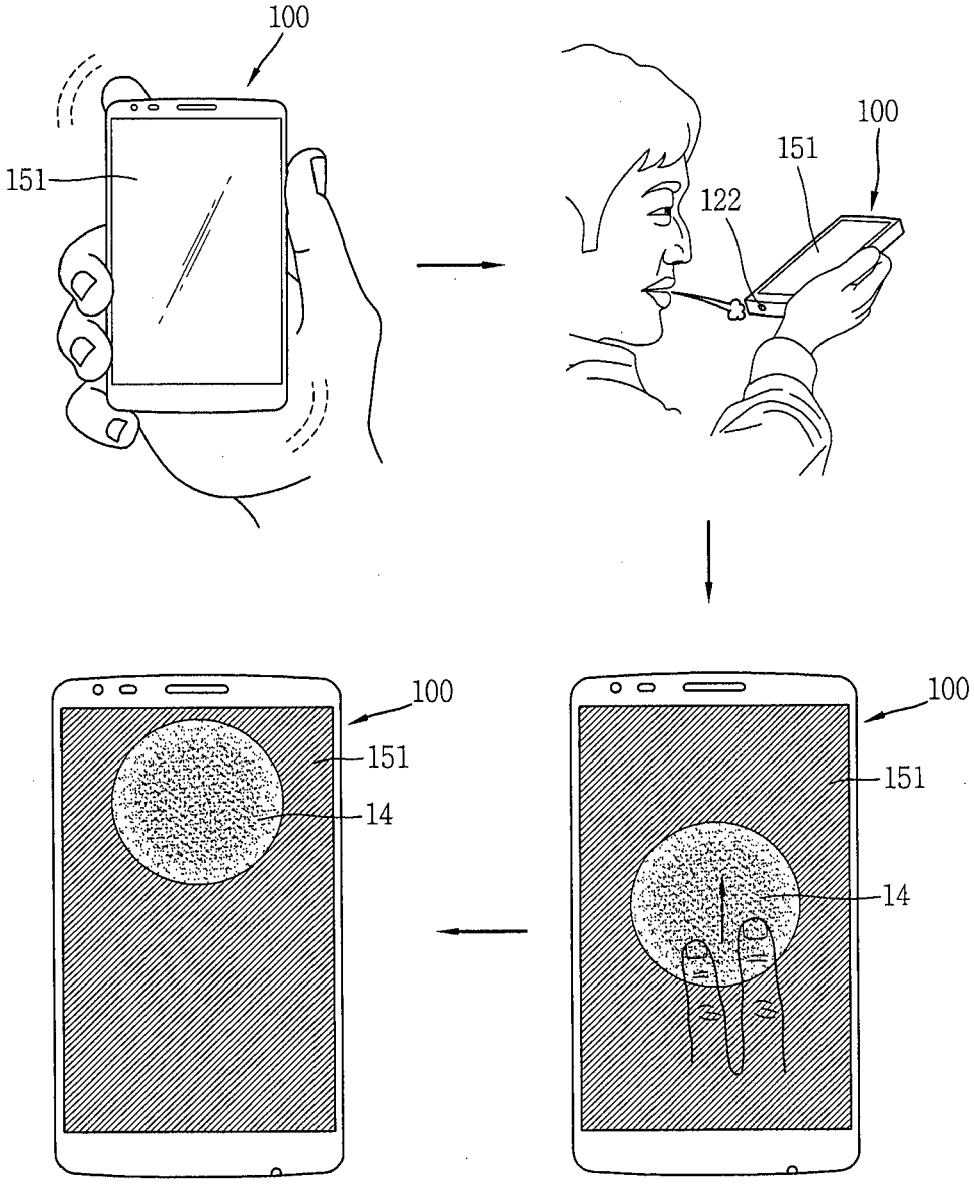


FIG. 5A

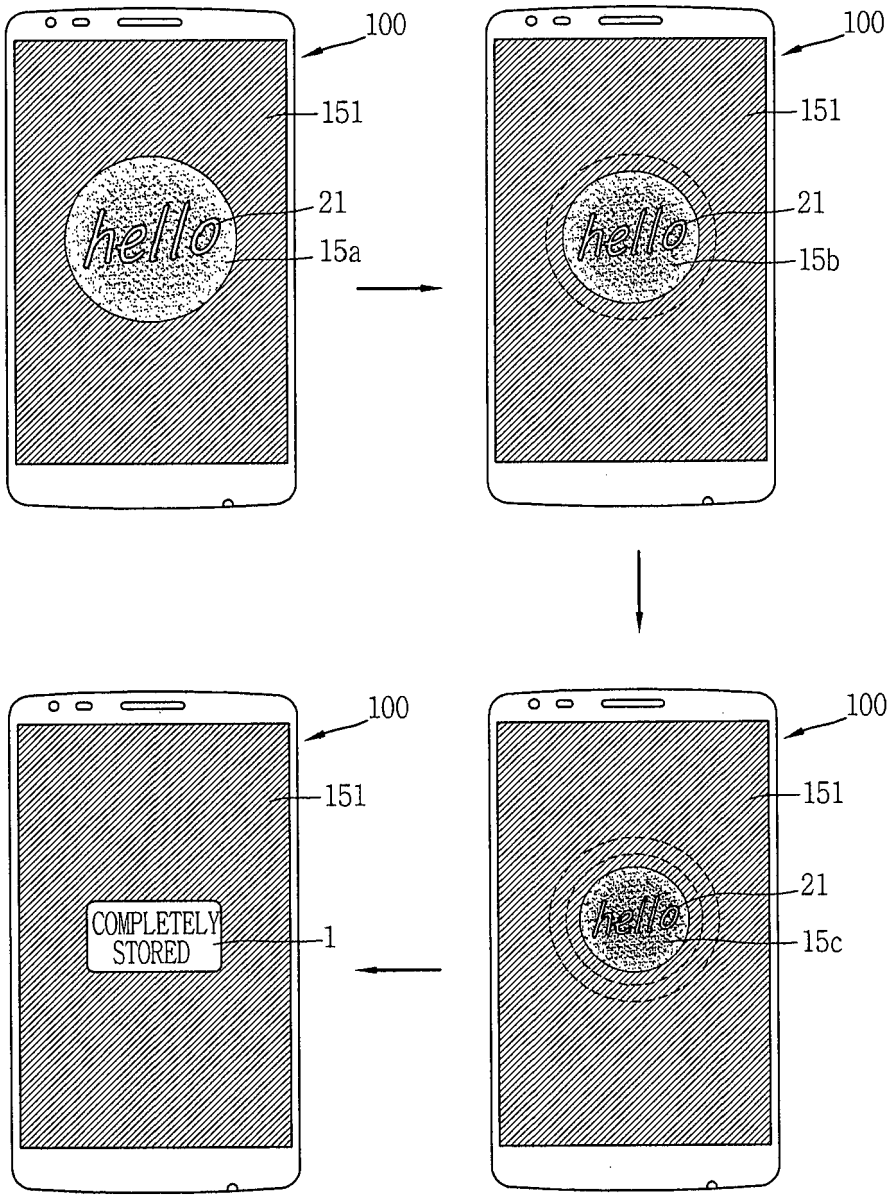

100
151
hello
21
15a
100
151
hello
21
15b
100
151
COMPLETELY STORED
1
100
151
hello
21
15c

FIG. 5B

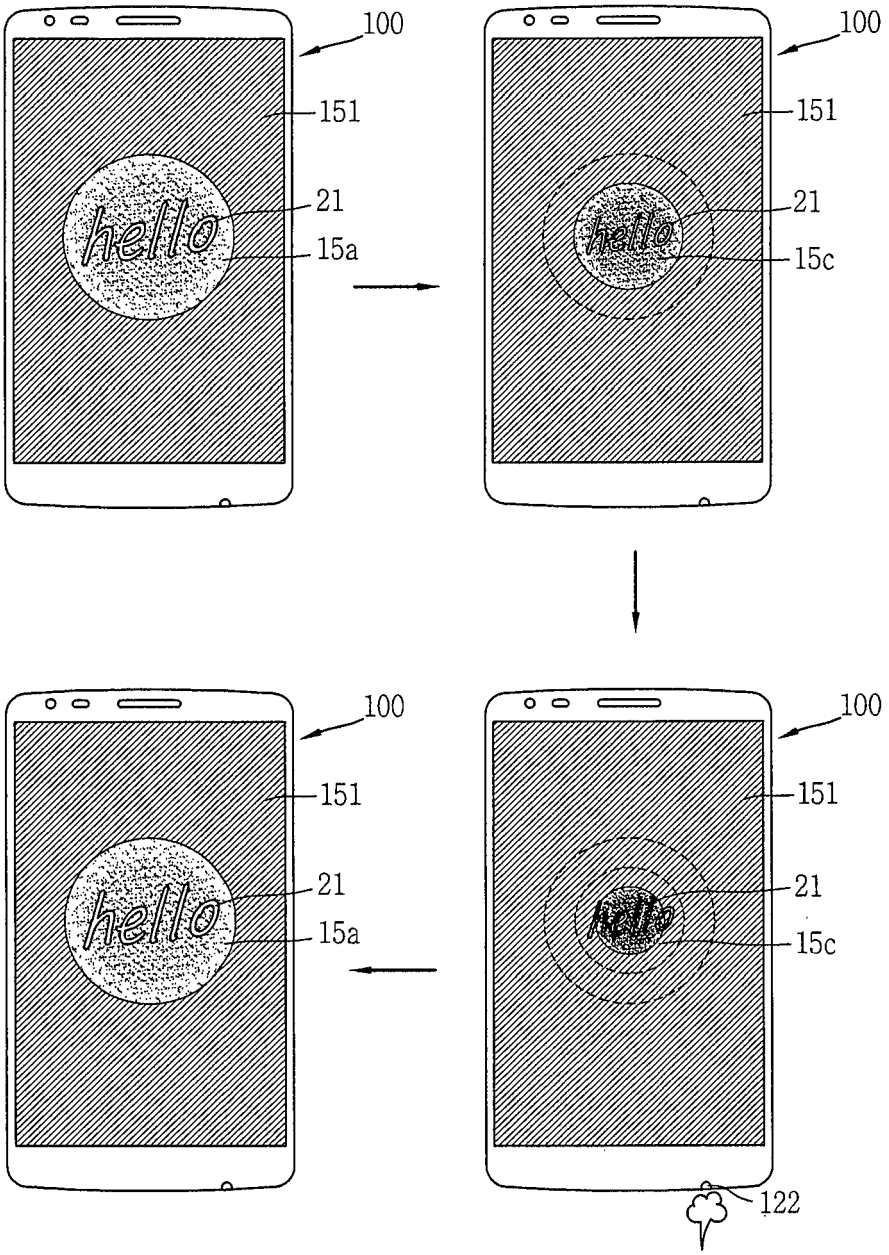

100
151
21
15a
hello
100
151
21
15c
hello
100
151
21
15a
hello
100
151
21
15c
hello
122

FIG. 5C

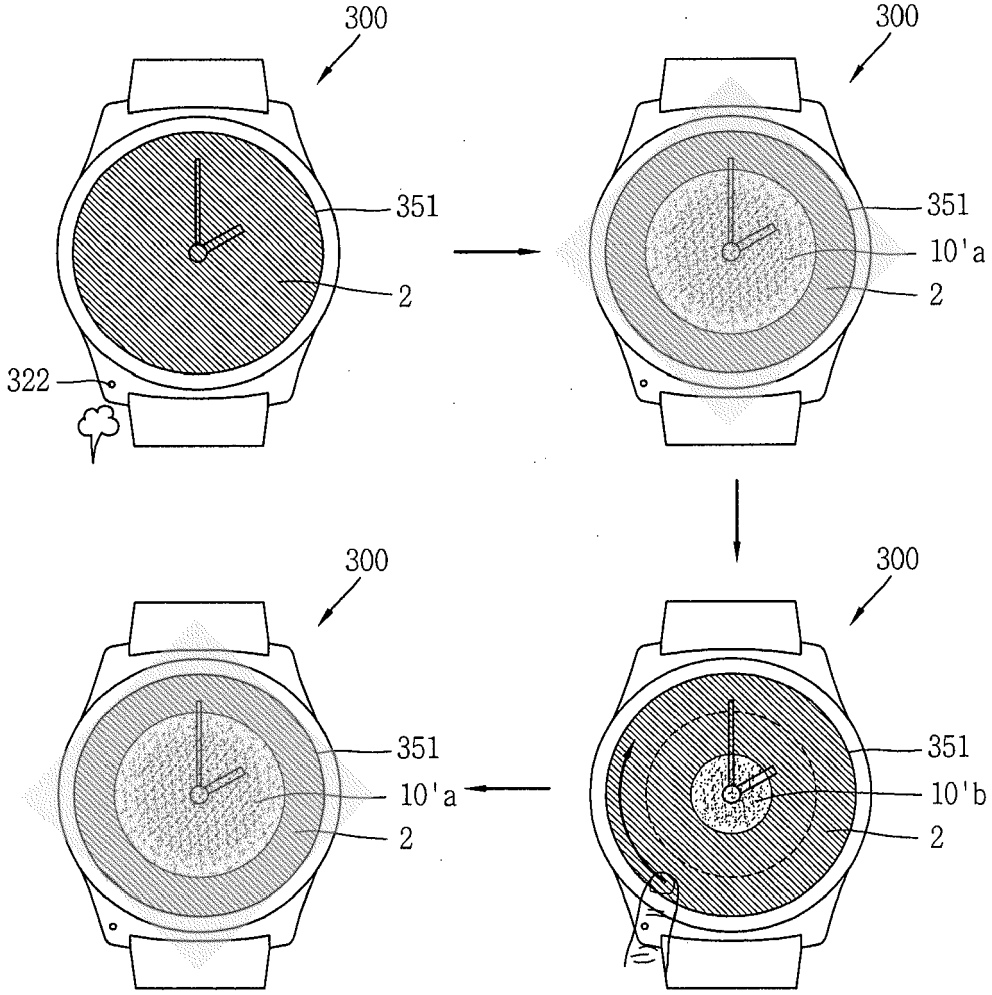


FIG. 6A

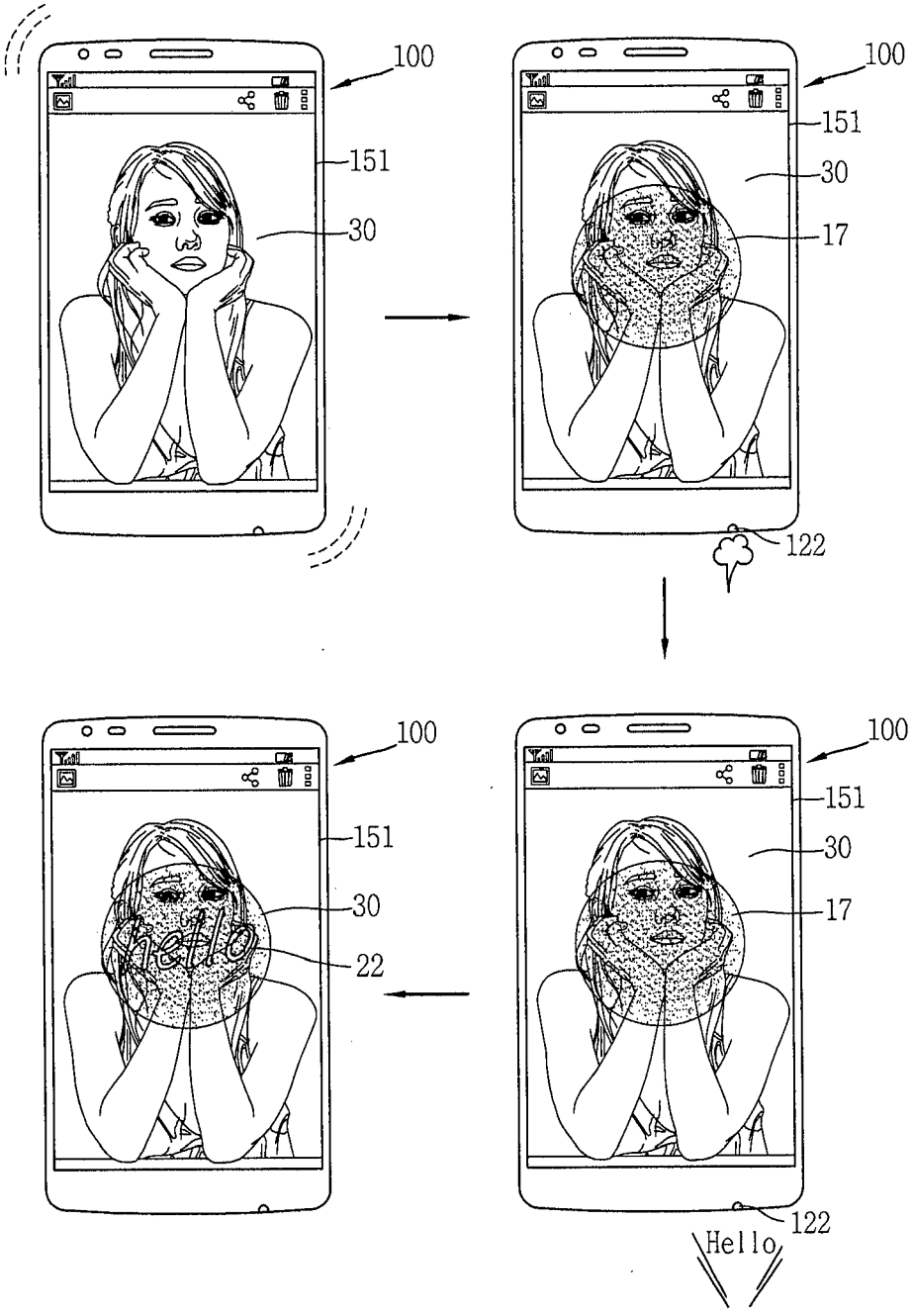
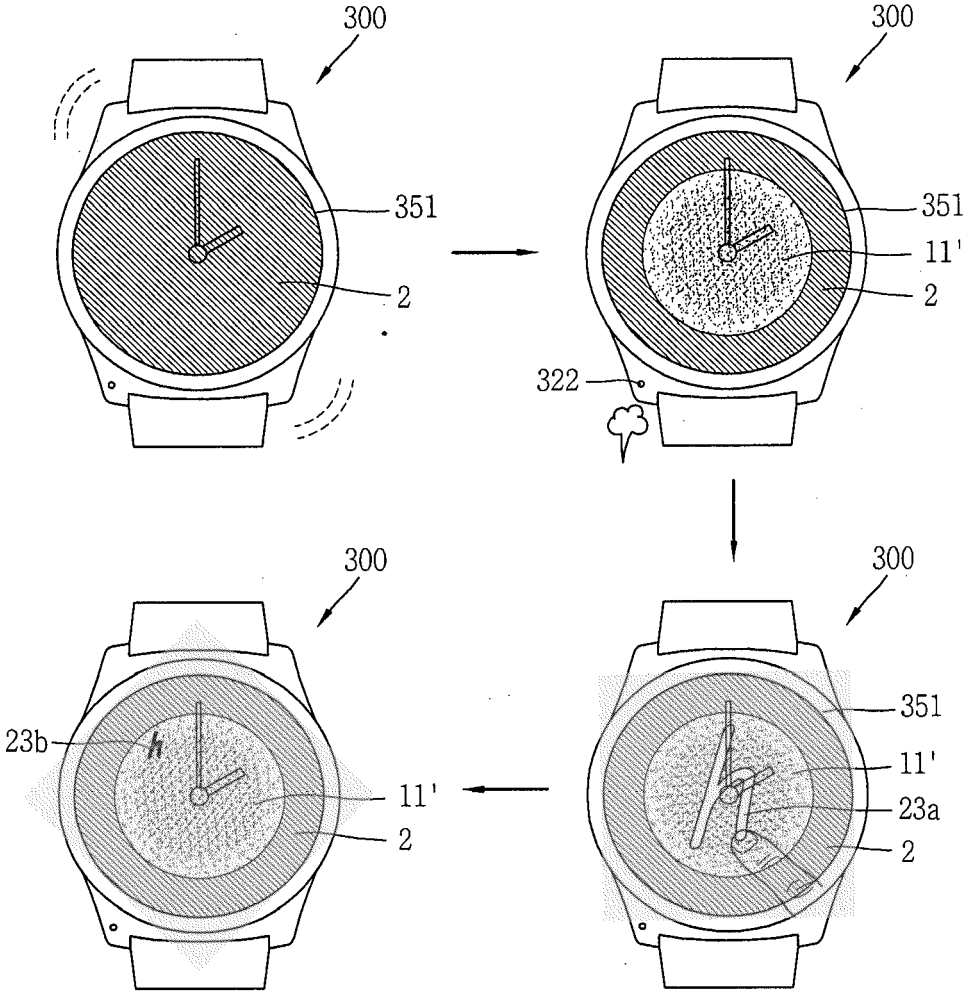


FIG. 6B



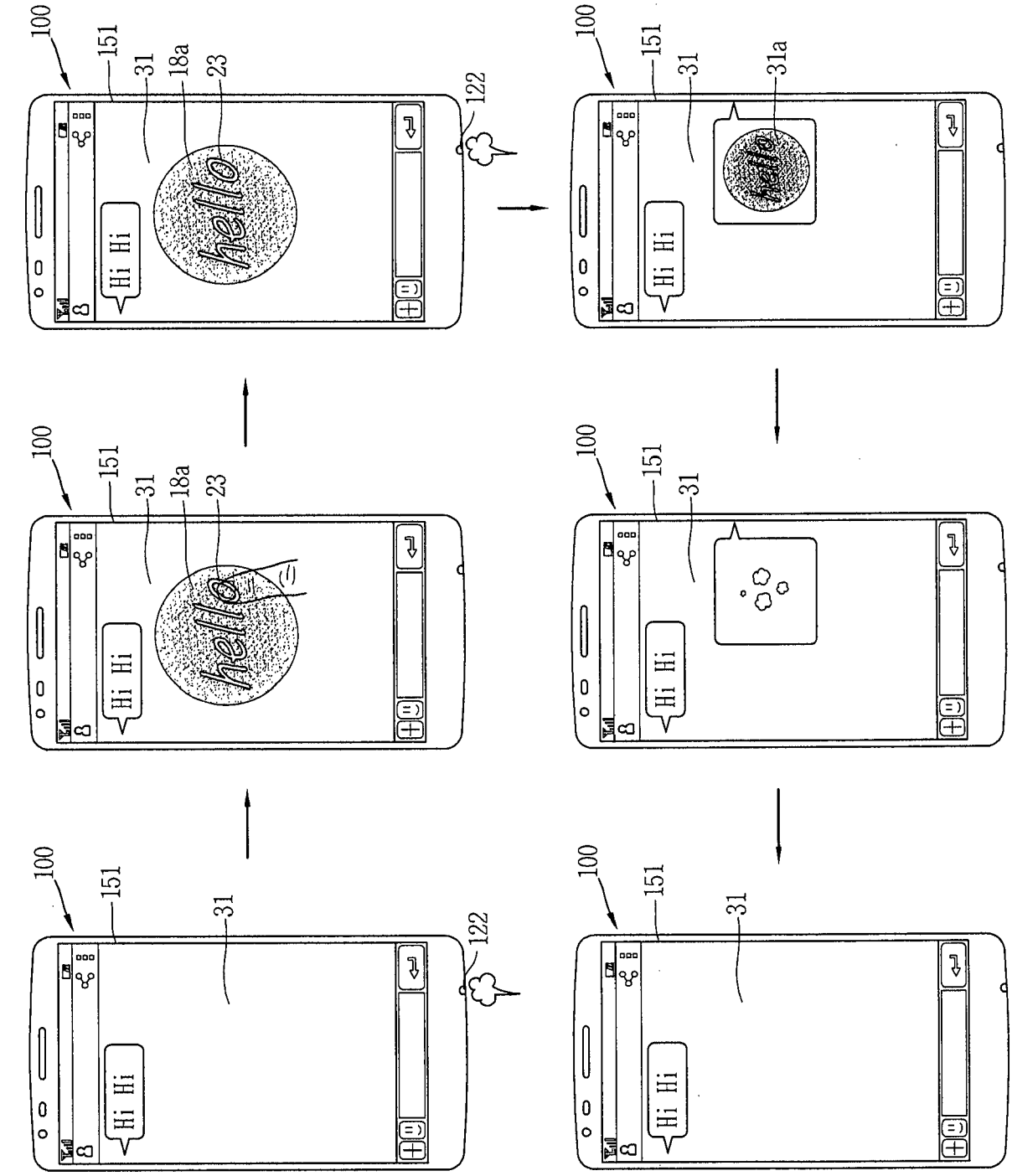


FIG. 7A

FIG. 7B

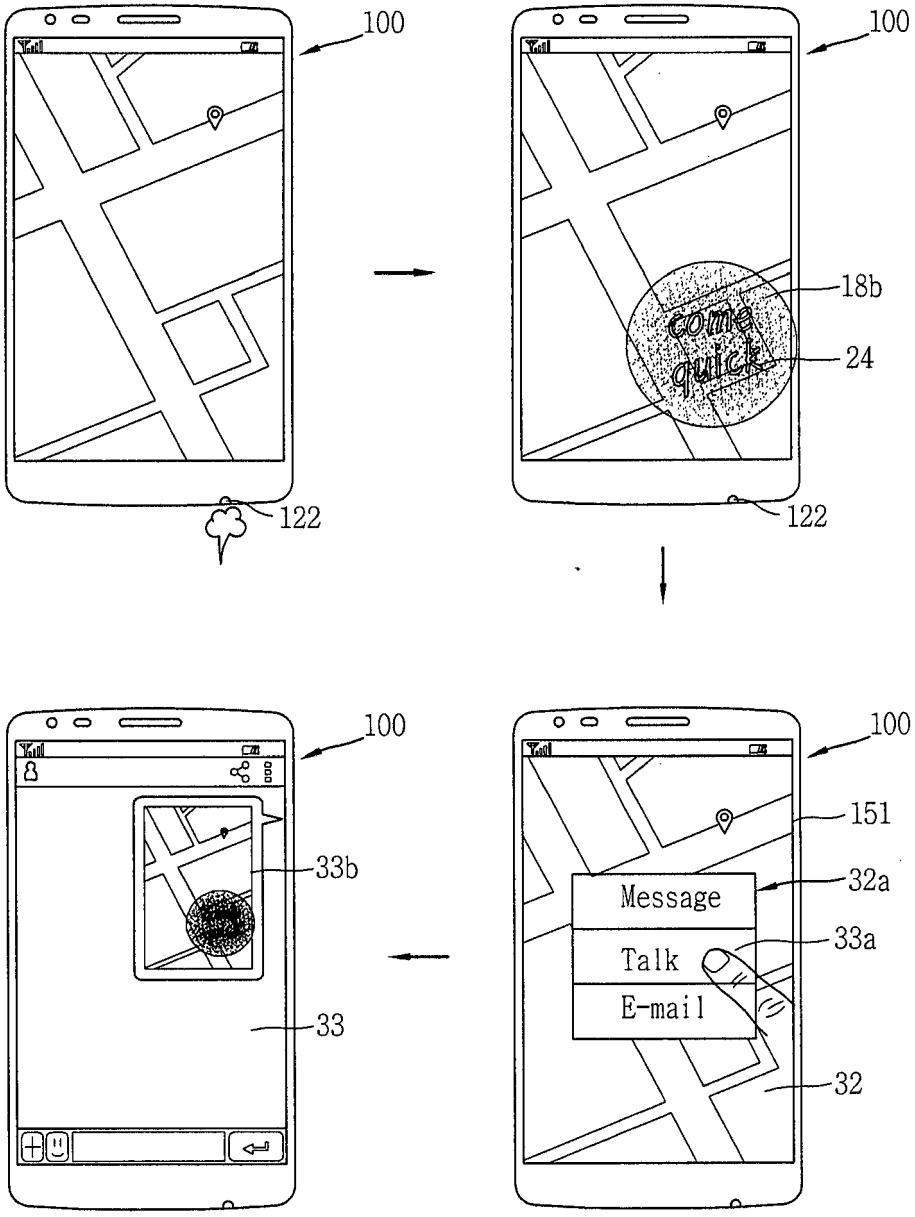

100
100
18b
come quick
24
122
122
100
100
151
Message
32a
Talk
33a
E-mail
32
33b
33

FIG. 7C

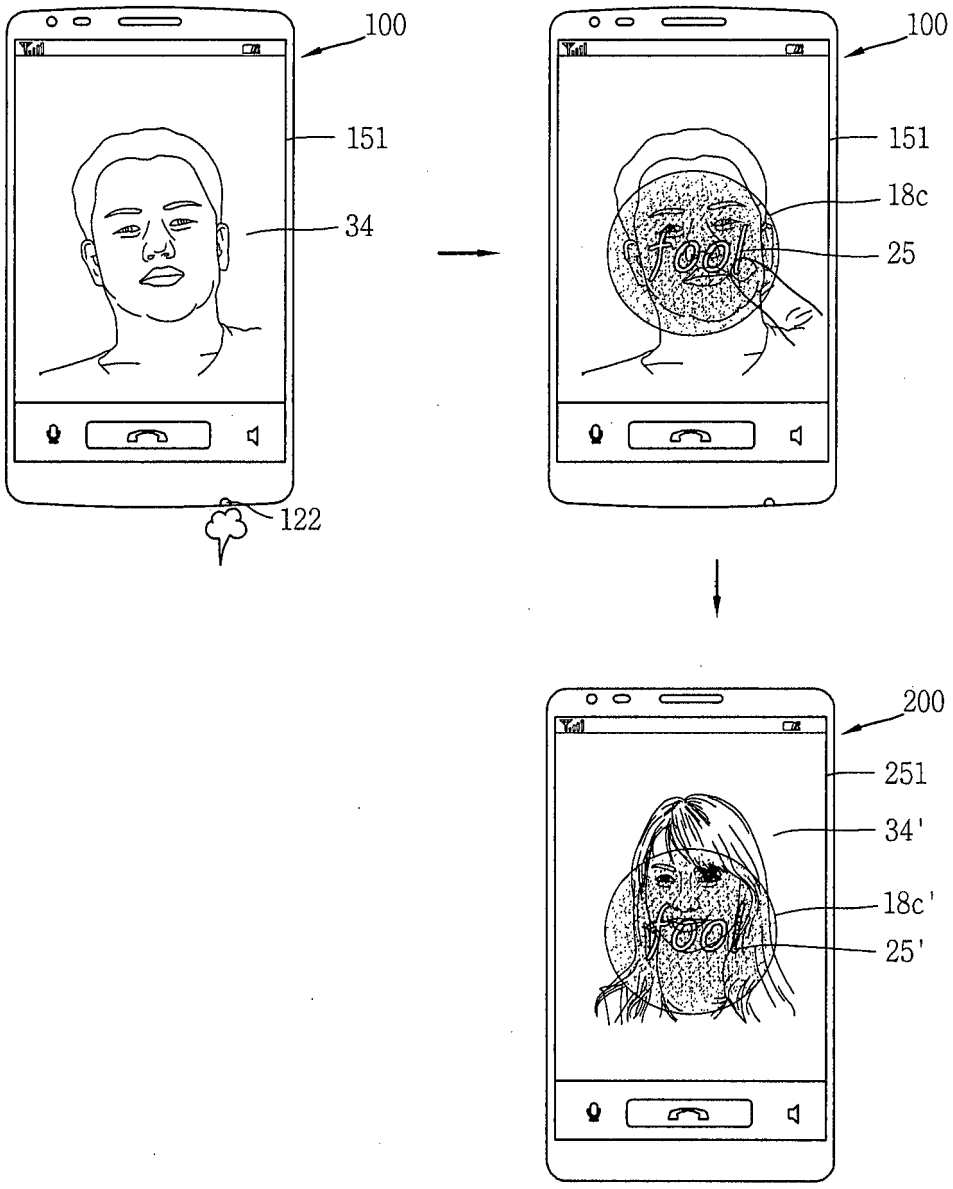


FIG. 8A

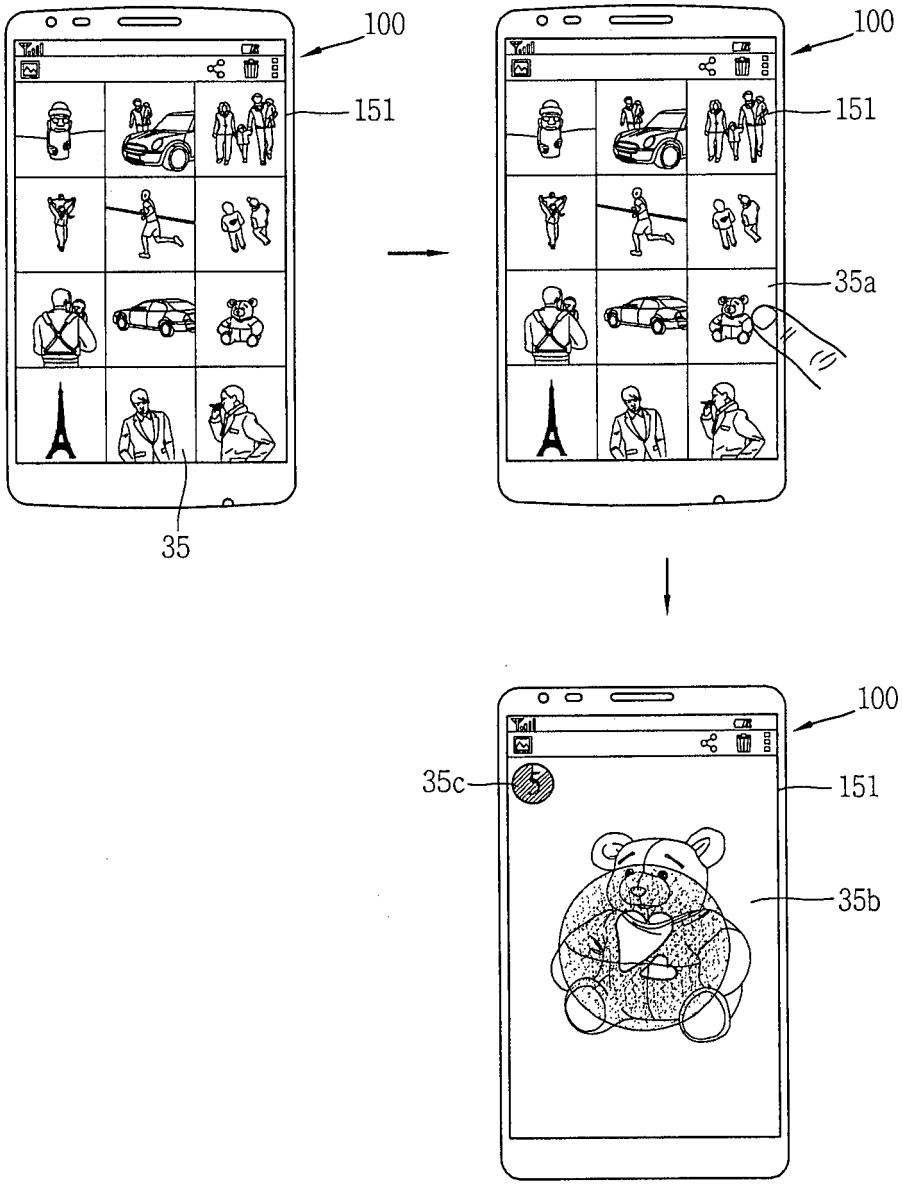
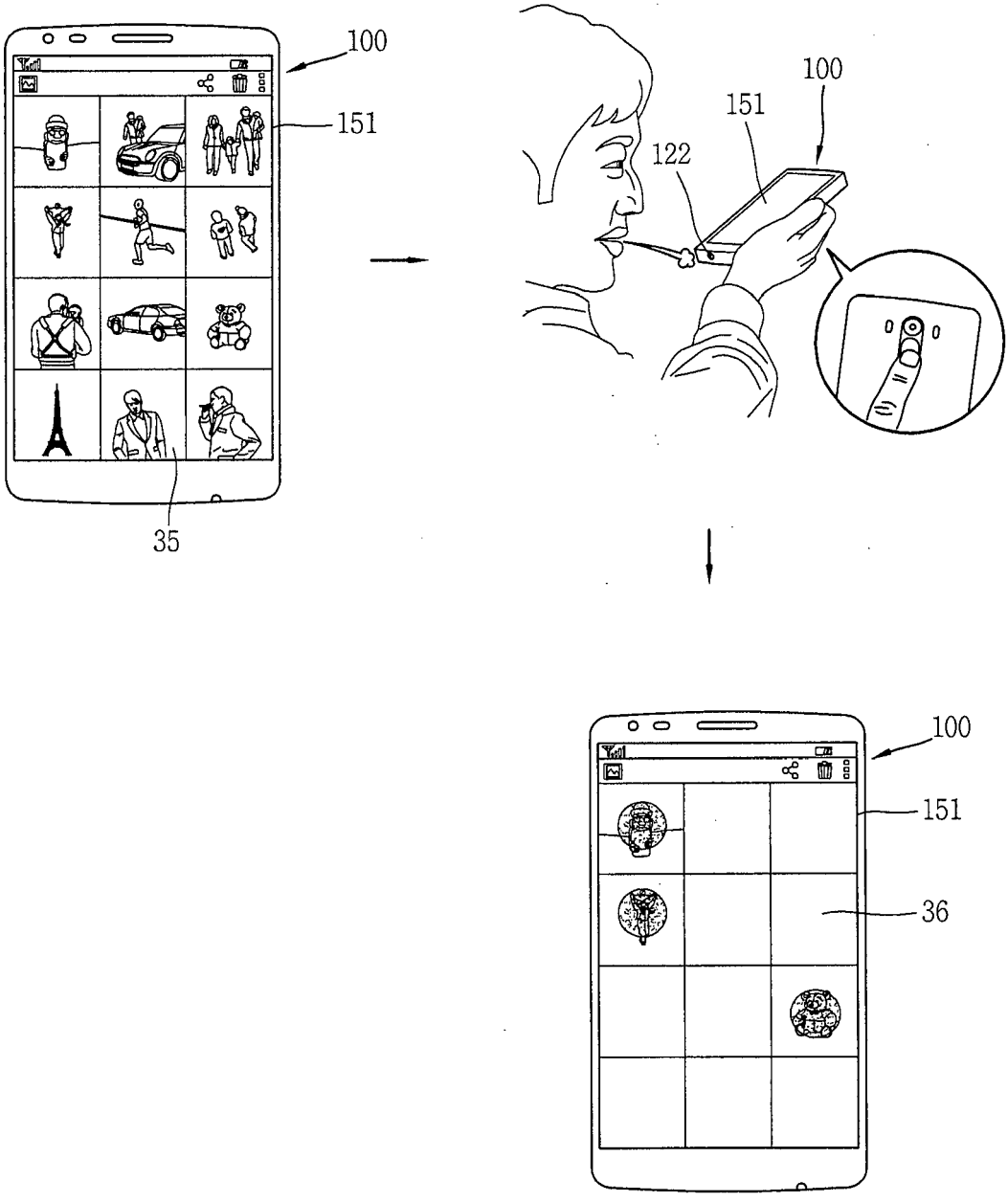


FIG. 8B



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EUROPEAN SEARCH REPORT

Application Number
EP 16 00 1327

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	US 2014/379341 A1 (SEO HO-SEONG [KR] ET AL) 25 December 2014 (2014-12-25) * figure 1 * * paragraph [0058] - paragraph [0060] * * paragraph [0092] - paragraph [0093] * -----	1-9, 12-15 11	INV. G06F3/16 G06F1/32 G06F3/048
X	WO 2015/020284 A1 (LG ELECTRONICS INC) 12 February 2015 (2015-02-12) * abstract * & EP 3 032 377 A1 (LG ELECTRONICS INC [KR]) 15 June 2016 (2016-06-15) * figures 6-8 * * paragraph [0207] - paragraph [0238] * -----	1-10, 12-15	
Y	EP 2 680 553 A1 (LG ELECTRONICS INC [KR]) 1 January 2014 (2014-01-01) * figure 4 * * paragraph [0115] - paragraph [0119] * -----	11	
			TECHNICAL FIELDS SEARCHED (IPC) G06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14 November 2016	Alliot, Sylvain

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 16 00 1327

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14-11-2016

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		US 2014379341 A1	25-12-2014
WO 2015020284 A1	12-02-2015	CN 105452990 A	30-03-2016
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		EP 2680553 A1	01-01-2014
		US 2014004908 A1	02-01-2014

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82